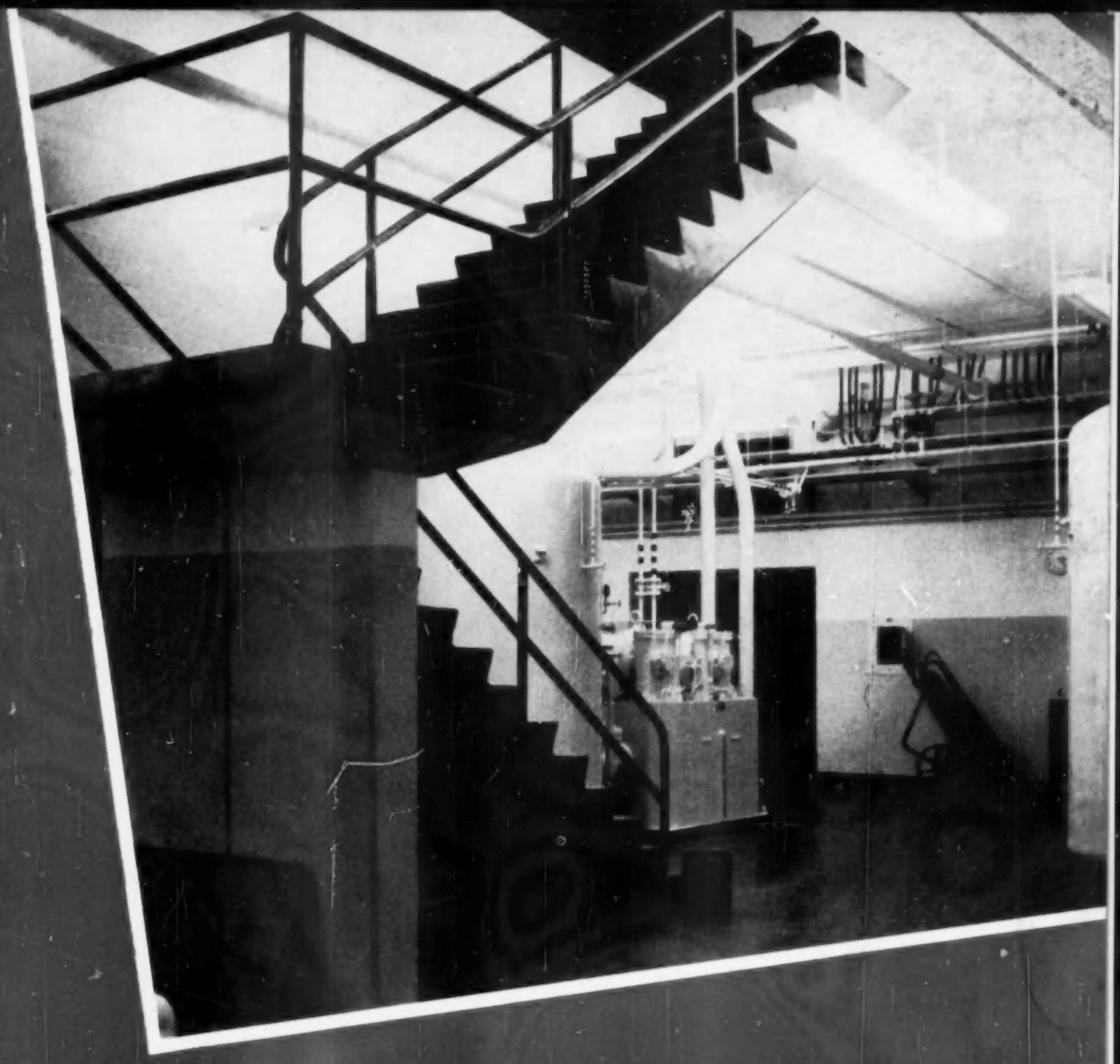

Safety Maintenance

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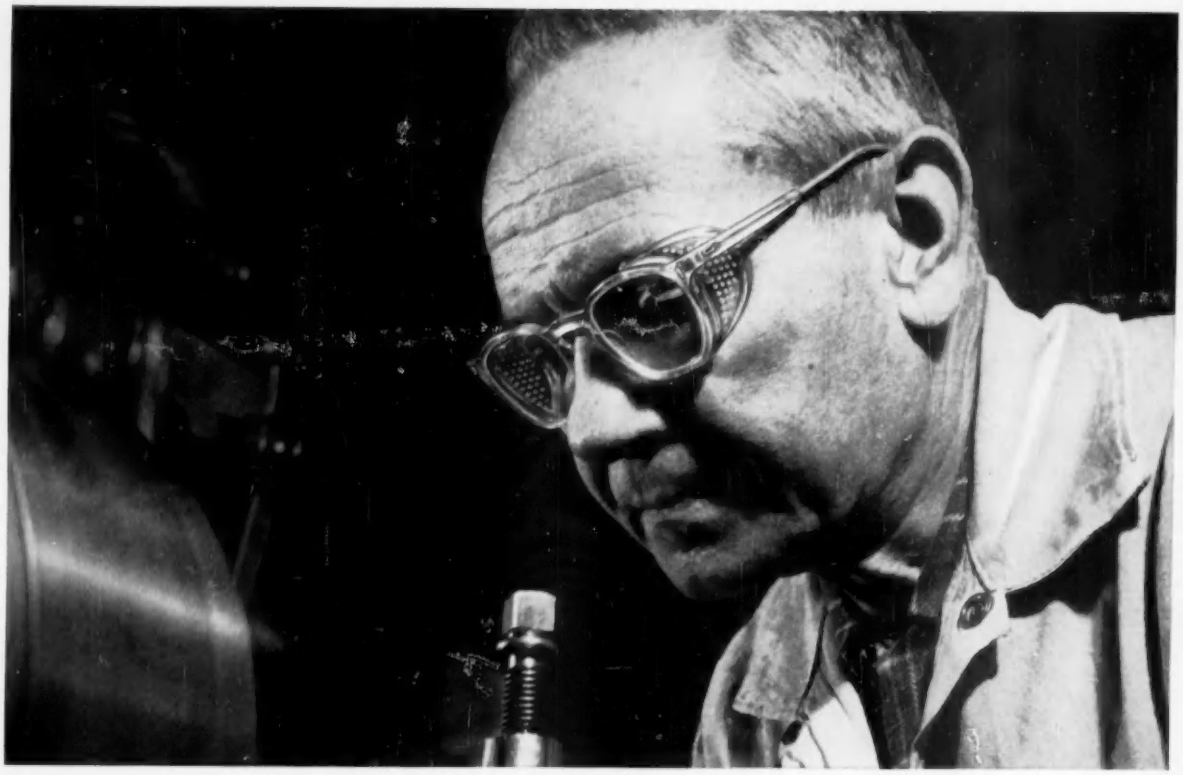

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When a worker has American Optical Tillyer hardened prescription safety lenses, he has the finest corrective-protective equipment money can buy. With the development of electronic computing it has become possible to achieve practically constant R$_x$ power in safety glasses from lens edge to lens edge based on the established Tillyer principle.* No matter what section of his lenses a worker may be peering through at a given moment he is assured of good visual efficiency. Whatever his job may be, this visual efficiency is certain to increase work efficiency and safety for himself and others. Balanced Vision, an exclusive American Optical development, is available in most prescription ranges, with clear or Calobar lenses in the ultrascopic shape. Your nearest American Optical Safety Products Representative can supply you with complete information. Or write for descriptive literature.

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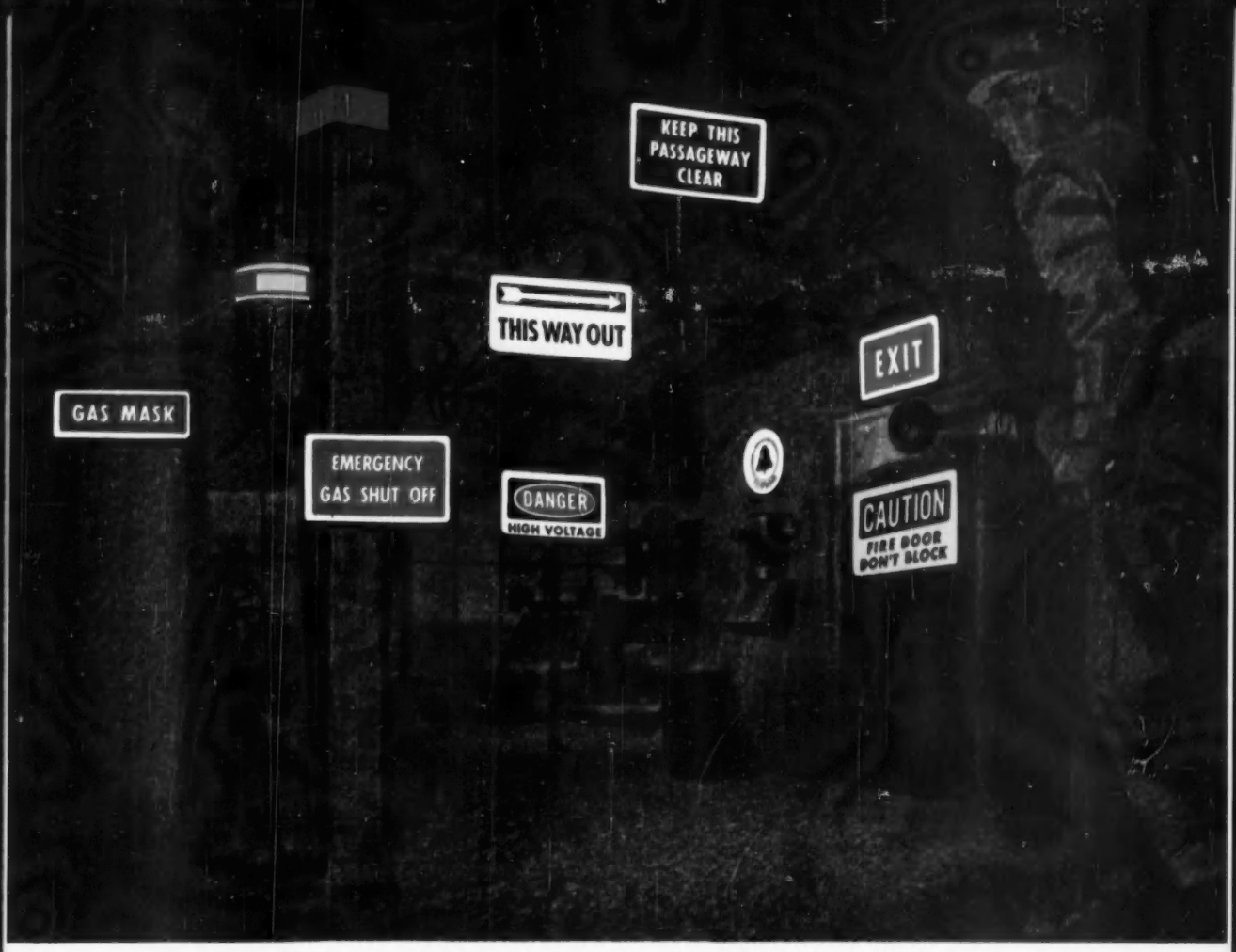
(Use Key # Z-1 on Inquiry Card on page 75)



Day and night, "SCOTCHLITE"® BRAND reflectorized signs point the way to better plant safety

The all-important safety story built into signs of "SCOTCHLITE" Reflective Sheeting Signs is told in the illustration above. Here, the beam from the night-watchman's handlight "kindles" these signs into reflective power up to 185 times greater than that of white painted surfaces—the signs leap into view; clearly relay their vital messages.

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(Use Key # Z-2 on Inquiry Card on page 75)

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Ask your own Safety Engineer or Insurance Company, then ask for a John B. Moore Sales Engineer to help you select the proper solvent for the job . . . AND FOR SAFETY

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Safety Maintenance

formerly "SAFETY ENGINEERING"

Volume 113, Number 1 **January, 1957**

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SAFETY MAINTENANCE is indexed regularly by Engineering Index, Inc., New York

GOOD HOUSEKEEPING
and PRODUCTION SAVINGS too
by job-spotting
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in PROTECTOSEAL
STORAGE CABINETS

✓ **Avoids** scattering dangerous flammable liquids throughout the plant, yet keeps them at conveniently located at-the-job stations to prevent time away from machines.

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✓ **Saves** solvents by keeping them in easy-to-use fire preventive safety containers of 5 gallons or less; prevents excessive evaporation, avoids spillage.

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Flame Arrester Vents safeguard large volume storage tanks of flammable liquids against fire and explosion. Modern swing-bolt design permits easy removal of vent covers and weather-hoods for visual inspection or cleaning.

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Please send Selection Chart and Price List of Fire Preventive Equipment for Flammable Liquids.

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Address_____

City_____ Zone____ State_____

(Use Key # Z-4 on Inquiry Card on page 75)

THE FUTURE SHOWS

Cleveland, Ohio *January 28–31*

Eighth Annual Plant Maintenance & Engineering Show and Conference (Public Auditorium). Clapp & Poliak, Inc., Exposition Management, 341 Madison Ave., New York 17, N. Y.

Los Angeles, Calif. *February 7–8*

Seventh Annual California Statewide Meeting of the Governor's Industrial Safety Conference (Biltmore Hotel). Div. of Industrial Safety, Calif. Dept. of Industrial Relations, 965 Mission St., San Francisco 3, Calif.

Richmond, Va. *March 3–5*

Southern Safety Conference & Exposition (John Marshall Hotel). W. L. Groth, Executive Director, P. O. Box 8927, Richmond 25, Va.

Philadelphia, Pa. *March 13–14*

Twenty-Third Annual Philadelphia Safety & Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, Manager, Philadelphia Safety Council, c/o Chamber of Commerce, 121 S. Broad St., Philadelphia 7, Pa.

New York, N. Y. *March 18–22*

Twenty-Seventh Annual Greater New York Safety Convention and Exposition (Hotel Statler). Carl F. Olander, General Chairman, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Boston, Mass. *March 18–19*

Thirty-Sixth Annual Massachusetts Safety Conference (Hotel Statler). Bruce Campbell, Manager, Massachusetts Safety Council, 31 State St., Boston 9, Mass.

Los Angeles, Calif. *March 18-20*

Fourth Annual Greater Los Angeles Safety Congress & Exhibit (Ambassador Hotel). Los Angeles Safety Council, Room 496, 610 S. Main St., Los Angeles 14, Calif.

Fort Wayne, Ind. *March 19–20*

Fourteenth Annual Northeastern Indiana Safety Conference and Exposition (Chamber of Commerce Building). Ivan A. Martin, manager, Safety Council, Ft. Wayne Chamber of Commerce, Ft. Wayne 2, Ind.

Gainesville, Fla. *April 3–5*

Fourth Annual Conference on Accident Prevention Engineering (University of Florida Campus). Donald B. Wilcox, Conference Coordinator, College of Engineering, Gainesville, Fla.

Pittsburgh, Pa. *April 2–4*

Thirty-second Western Pennsylvania Safety Engineering Conference & Exhibit (Sheraton Hotel). Harry W. Brainerd, executive manager, Western Penn. Safety Council, Inc., 605 Park Bldg., Pittsburgh 22, Pa.

Bethlehem, Pa. *May 6–8*

Thirtieth Annual Eastern Pennsylvania Safety Conference, Harold A. Seward, Secretary-Treasurer, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

Niagara Falls, N. Y. *May 8–9*

Seventeenth Western New York Safety Conference, in co-operation with the American Society of Safety Engineers (Niagara Hotel). Patsy E. Gismondi, Executive Secretary, 1436 Delaware Ave., Buffalo 9, N. Y.

Columbus, Ohio *April 9–11*

Twenty-Seventh All Ohio Safety Congress & Exhibit (Deshler Hilton Hotel). A. W. Moon, Congress Manager, Rm. 611, Ohio Departments Bldg., Columbus 15, Ohio.

Kansas City, Mo. *April 11–12*

Central States Safety Congress (Hotel President). G. M. Burns, director, Kansas City Safety Council, 419 Dwight Bldg., Kansas City

SEND THIS PERSONAL SAFETY MESSAGE

TO EVERY ONE OF YOUR EMPLOYEES!

Safety is made attractive...vivid...colorful...

each worker clearly sees how safety benefits him.

You get enthusiastic safety cooperation instead of

tolerance...from every employee...every month.

YOUR
Safety News
PUBLISHED IN THE INTEREST OF YOUR SAFETY
THE JOHN DOE COMPANY, INC.
PROTECT YOURSELF
3
WAYS
There are three safe practice ways that do the most good in keeping free of accidents, all based on your personal desire to know safety and keep yourself safety-minded by studying the hazards of your work. They are
1 Make sure all guards are in place and working and wear the personal protective equipment your job requires.
2 Learn the safe way to do a job and do it just that way.
3 Report, avoid or eliminate all unsafe conditions.
As we see it: Safety is part of every job and like any craft it requires skill.
John Doe

Size 5½" wide x 8½" deep

...talks the worker's language!

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Your Signature Here

NOTE:

Your Safety News is designed to promote better employer-employee relations. Every item is carefully weighed from this viewpoint.

INSIDE PAGES
(pages 2 and 3)

So Goes the World
Lions & Machinery have Hungry Jaws
NEVER REACH INTO MACHINERY WHILE IT IS RUNNING!
WANTED
Guard Well
from the CARELESS ACTS of others the WISE MAN corrects his own
SAFETY SHOES
WORK OVERTIME
Dress for Safety
SAFETY SHOES
FALLS
FALLS KILL 80 EVERY DAY

IN YOUR EMPLOYEE'S INTEREST

Your employee's self interest in his own safety is always emphasized. Even household hazards are covered to keep him safety-conscious every minute, not only in the plant, but at home and on the way to work.

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Artwork is carefully chosen to lodge home each point. The cartoon style makes YOUR SAFETY NEWS as familiar and as welcome as the Sunday supplement.

THE "FOLKSY" APPROACH

Keeping the contents folksy, adding the grace note of humor, delivers your safety message with a nudge instead of a bludgeon. Your monthly shot gets enthusiasm instead of tolerance.

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Generous use of color gives sparkle, adds to the attention-riveting qualities of YOUR SAFETY NEWS. Each issue is as lively as any news-stand favorite.

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NOTE: Although a personal signature is effective, some firms substitute: SAFETY DEPARTMENT, YOUR SAFETY COMMITTEE, A SAFE WORKER, etc.

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Cleaning Stations

Serving Every Major Industry in America

(Use Key # Z-5 on Inquiry Card on page 75)

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● THE 15:85 FALLACY

OVER the years, many safety authorities in private industry, and in state governments as well, have sought to fix the responsibility for accidental injury. Through the use of detailed studies, not always infallible, causes of injury have given rise to the conclusion that invariably 15 percent of all accidents can be charged to mechanical failure or physical hazards while 85 percent inevitably represent human failure or faulty behavior.

With industry's great technological advances and management's growing interest in the widespread, tangible benefits of safety effort, we are safe in assuming that the preponderance of all accidents logically stem from the factor of faulty human behavior. But is the ratio of 15 to 85 percent really infallible?

According to Bulletin 67 of the Bureau of Labor Standards, U. S. Department of Labor, the commonly accepted 15:85 percent has little meaning or value in the work of accident prevention.

SAFETY MAINTENANCE joins with the Bureau in the belief that the ratio can be fallacious. By trying in every case to pin-point only the chief cause of injury, such studies ignore the fact that many injuries result from a combination of **both physical hazard and human failure.** Thus, both factors lend themselves to concerted action for ultimate improvement. Obviously, eliminating entirely or reducing the physical hazard certainly should lessen the likelihood of injury arising from human behavior. Also, in dealing with an individual plant we must consider accident prevention in each plant operation and cannot accept ratios arrived at from data covering an entire state or a large number of varied plants. There are too many extremes and gradations between plants for much practical value.

The 15:85 ratio is just a little too easy and too pat! As the bulletin incontrovertibly points out, the ratio can do much harm by an undue emphasis upon "carelessness" as the cause of an accidental injury (see SAFETY MAINTENANCE December editorial).

We are told that detailed accident investigations often actually contradict the ratio theory. Except in a relatively few plants where practical hazard elimination has reached the maximum, the great majority of injuries stem from multiple factors—both physical and human.

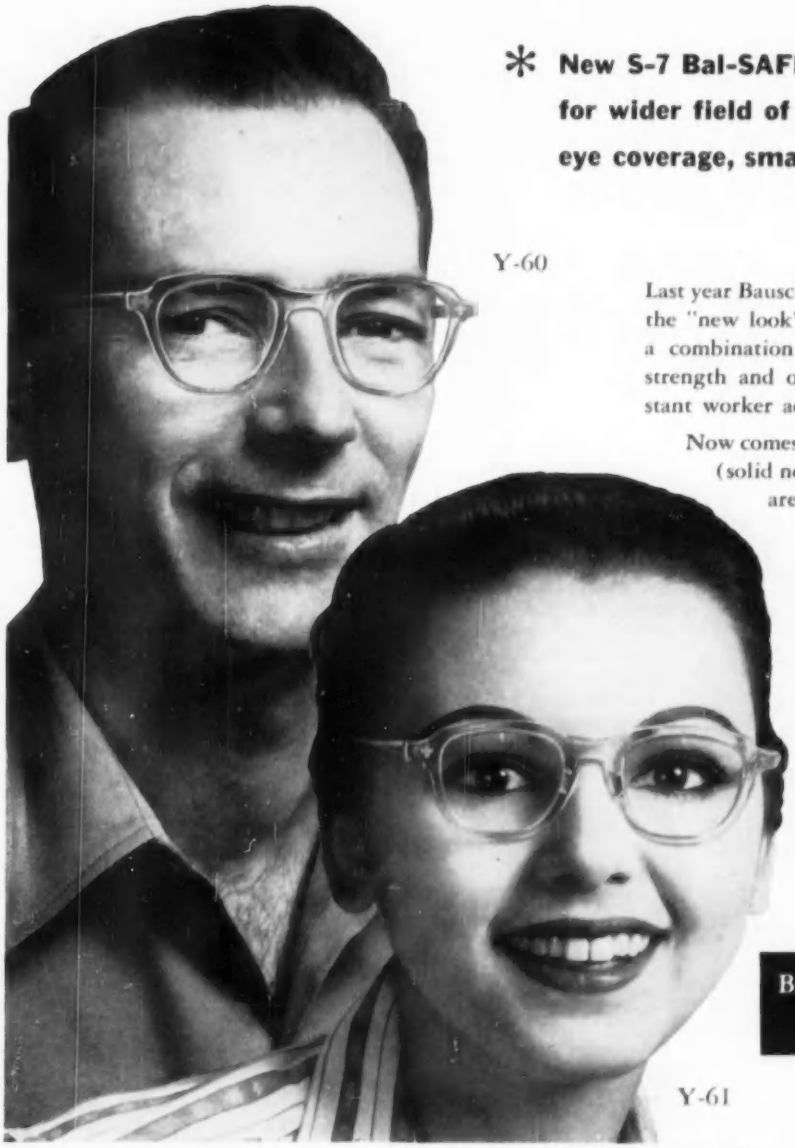
The Labor Department cannot be too forceful in emphasizing that an injury is almost never caused by unsafe conditions alone. Likewise, a single act of faulty human behavior is rarely the only cause involved in injury.

If the factor of hazard were eliminated entirely, there would be no injury; if the human factor could be eliminated, there would be no injury. Since neither element can be banished completely, injury elimination can be achieved only by reducing physical dangers to the minimum and developing improved patterns of human behavior. H.A.

Best Wishes for the New Year

NOW...you can have the NEW LOOK*

in ACETATE Safety Glasses, too!



* **New S-7 Bal-SAFE lens shape . . . for wider field of vision, better eye coverage, smarter appearance.**

Y-60

Last year Bausch & Lomb introduced Titan, bringing the "new look" to quality safety eyewear. Titan is a combination metal-plastic frame of remarkable strength and outstanding appearance, winning instant worker acceptance.

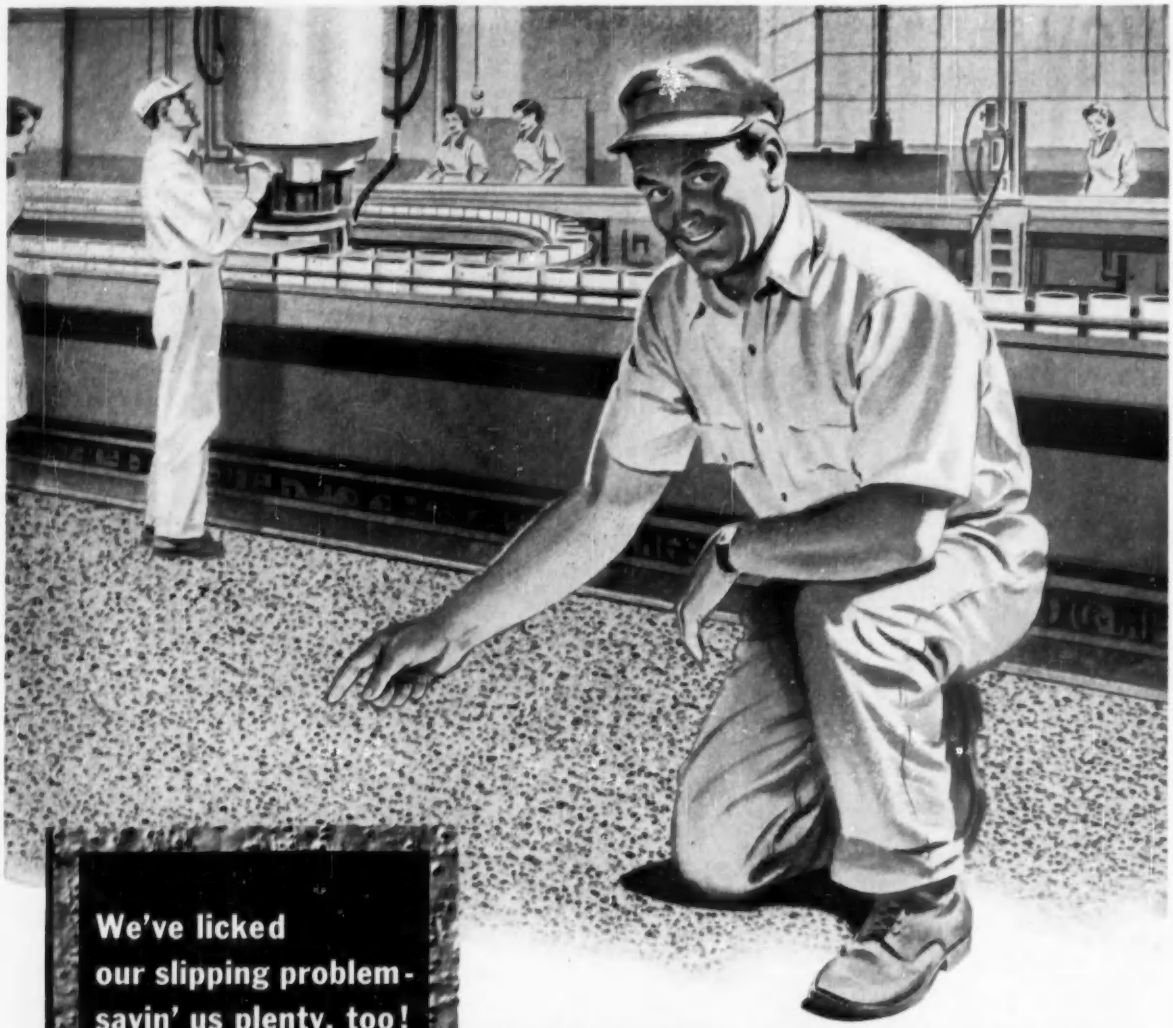
Now comes an all-plastic companion frame. Y-60 (solid nose pads) and Y-61 (adjustable pads) are made from finest quality uniform texture sheet acetate. With the outstanding new S-7 lens shape . . . with exclusive strength features in bridge, temple and endpiece areas . . . you'll want Y-60 and Y-61 frames in all proper applications in your plant immediately.

For complete information, write today for Booklet A-1458. If you don't already have it, ask for the details on Titan, too: Booklet A-1423. Bausch & Lomb Optical Co., 90513 Smith St. Rochester 2, New York.

BAUSCH & LOMB

Y-61

(Use Key # Z-6 on Inquiry Card on page 75)



We've licked our slipping problem - savin' us plenty, too!

He's talking about ALGRIP—A.W. ALGRIP—the world's only abrasive rolled steel floor plate that provides super-safe footing under the *most hazardous* slipping conditions—on flat *or inclined* surfaces.

ALGRIP licks slipping and skidding hazards thoroughly by providing thousands of abrasive traction particles at every step. It's made by a patented process in which a grinding-wheel type of abrasive is rolled—*not coated*—to a controlled depth as an integral part of tough steel plate. Usage merely exposes more abrasive.

Look around for slipping hazards and make a test installation in your worst area. It'll save you plenty, too, as accident and insurance rates go down. Use it as an overlay or as independent flooring. ALGRIP fabricates easily and requires no maintenance.

ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALGRIP—*approved for safety by Underwriters' Laboratories*

ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

Please send A.W. ALGRIP Booklet AL-535

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Title_____

Company_____

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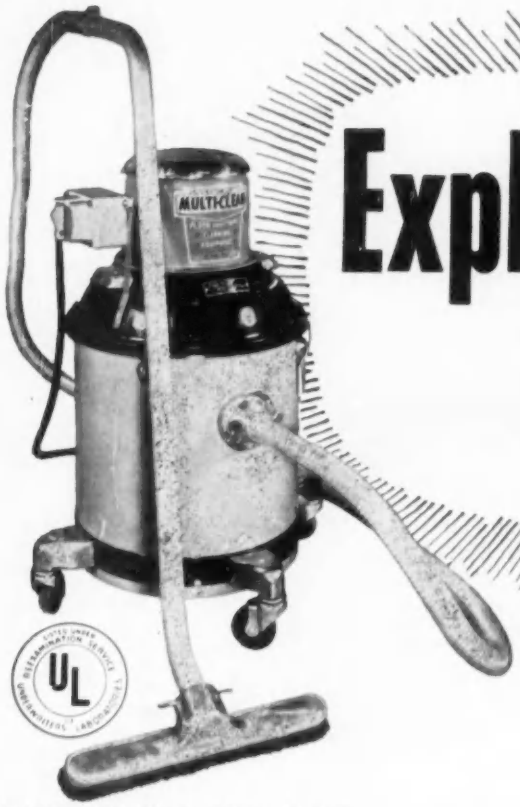
City_____ Zone_____ State_____

OTHER PRODUCTS:
A.W. SUPER-DIAMOND economy rolled steel floor plate—Plates—Hot and cold rolled sheet and strip—(Alloy and Special Grades)

(Use Key # Z-7 on Inquiry Card on page 75)



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COMPLETELY Explosion-Proof!

Yes, this is the *first* industrial vacuum cleaner which combines portability, efficiency, and *complete safety*.

The MULTI-CLEAN H-500 EXPLOSION-PROOF Vac has been tested by UL and approved for use in Class I, Group D and Class 2, Group G locations.

This now means that you can use this wet-dry vac amid explosive gases, vapors, dust, and in dozens of other situations where danger of explosion or fire had previously made use of a vac too risky.

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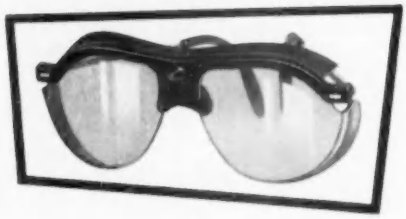

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(Use Key # Z-9 on Inquiry Card on page 75)

Maintenance Men Are Your Safety Inspectors:

GIVE THEM THEIR DUE!

by **LEO A. BROOKSHIRE**
Assistant Safety Engineer
Thiokol Chemical Corporation
Huntsville, Alabama

How many times have you heard the plant manager commend his maintenance employees? My guess would be seldom, if ever. Yet, the men behind the scenes in production and in safety, too, are the plant maintenance crew.

Each plant supervisor calls for the maintenance man when he needs help and he is grateful . . . for a short time. The maintenance employee finishes one job then has to rush to the next emergency. Just as soon as he leaves the original work area the supervisor complains about the mess left over from the rush job.

Don't be too critical of these unseen magicians when you can praise them for the emergency feats they perform daily.

The initial step in the plant accident program is to **sell** safety to the maintenance employees through education and never through force. They are human, like the rest of us, and resist force. Utilize all educational and promotional media to place safety where maintenance and other employees can be exposed to it. Let safety grow on them, and add incentives to increase their interest.

Often overlooked by supervisors and safety engineers is the fact that maintenance personnel have a unique insight into a plant's accident potential. Maintenance men see the operation as it happens and in many cases view the unsafe conditions or unsafe acts we never see or fail to recognize.

Promotes Foresight

You might put up a sign "Safety Inspectors At Work" in lieu of "Maintenance Men At Work" if you will cultivate their friendship. If you have them report unsafe conditions and unsafe acts to you or the supervisor in charge, you can use "foresight" in accident prevention rather than "hindsight."

The maintenance employees in our plant have a scheduled "5 minute" safety talk each Monday prior to their work call or, if not convenient, at the next best time. The discussions last much longer than the scheduled time and cover safety within the group, and specific recommendations are passed up through channels to the department head.

Our maintenance employees have formulated regular inspection programs of their own. The schedule for this inspection program was coordinated by our safety organization. Consequently, all fixed and mobile equipment come under the preventive maintenance inspection conducted as per the work sched-

(Continued on page 56)

Job Analysis: The Key

by **ANDERS V. THOREN** *

Unsafe acts committed by persons as compared to unsafe conditions have an approximate ratio of seven to one. Therefore in order to maintain uninterrupted production, the operator must be protected from the machine. As an initial step toward this protection, make a job safety analysis:

1. What is the function of the machine or what process is involved? Are we concerned about its mechanics or is the problem of an electrical or chemical nature?

2. Is only the point of operation involved?

3. How is the machine installed in relationship to other equipment?

4. Should the machine or process be guarded for protection of the operator, other employees, other machines?

Careful evaluation of these points will generally suggest some concrete ideas. Using a dough mixer as an example we arrive at the conclusion that the operator can get caught in either the agitator or in the gears. The guarding therefore should be such that the mixer cannot be operated with the cover open. Consequently the cover should be provided with an electrical interlock. In addition the starting switch should be conveniently located near the machine. The drive and gears should be suitably enclosed. If a tumbler is involved, the above holds good but an enclosure must be provided around the tumbler and the interlock must be located on the gate of the enclosure instead of on the cover.

If an entire process is involved, such as a spray painting operation in addition to any mechanical guards, such as fan enclosures, we also have to consider the electrical installation, exhaust systems, storage of volatile liquids, etc., as we have an explosive atmosphere to contend with.

In guarding the point of operation, as on a press, we have to bear in mind that the guard must give the desired protection to the operator without materially reducing the output of the machine and without creating other adverse conditions which may offset its effectiveness. The owner sometimes must be convinced of its benefits. The operator also must be convinced that the guard is put on for his safety. Therefore, in addition to selling the guard itself, persuasion, appeal and instruction must at times be included.

It must be emphasized that after guards have been installed on the machines, they must not be tampered with. In a large refrigerator manufacturing plant there were several large blanking presses in operation, each provided with a two-handed device and consisting of two electric push buttons. Each operator had been instructed to produce blanks for 50 minutes of every hour and then could have the remaining 10 minutes for relaxation to get a break in the monotony of the work. The procedure was accepted but to the surprise of the supervisors, the employees not only stepped up production but had 15 to 20 minutes of leisure time out of every hour. The superintendent made a careful check and found an ingenious way had been developed to cheat the effectiveness of the two-handed device. A two by two had been made up, straddling the two push buttons, and on the two by two had been nailed two small pieces of wood which lined up with

* The author is Assistant Supervising Engineer for a leading insurance company.

How to Safety-Analyze the Job

1. Determine what process is involved or what exposure the machine offers.

2. In regard to a machine, is it guarded or unguarded?

3. If the machine is guarded, is the guard effective? If not, what should be done? Are other guards satisfactory?

4. Is the machine installed in a proper position or place?

5. Can the machine be safely and properly lubricated and adjusted?

6. Does the machine offer any hazards to other operators or other machines?

7. Should color contrast or special lighting be used?

8. How is raw material stored and fed, how is the finished product ejected and stored, and how is scrap material disposed of?

9. What dress or attire is used by the operator? What is his stance and position while operating the machine? Is he exposed to unnecessary fatigue?

10. Surroundings in general. Housekeeping, etc.

to Machine Guarding

the contacts. The two by two had been suspended at proper level and by pressing this rig up against the buttons the press was kept in substantially constant operation, which explained the increase in production—naturally also the exposure. Needless to say a considerable shake-up took place and the brackets were put in over the buttons to discourage further research work on the part of the operators.

In addition to point of operation guards, shielding must also be provided over main drives, for protection to the operator as well as others. In some cases adjustment points must also be guarded, and it may be necessary that no adjustments be made unless the machine is shut down. This is accomplished by installation of electric contacts or electronic devices.

Again, people must be taught and convinced of the importance of guarding as some resent changes and believe that a guard is a handicap. Only after they have been fully convinced do they accept the change. For example, in a private power plant the dampers to five water tube boilers were manually operated and as the load changed and different burner tips had to be put into the burners, the firemen had to readjust the dampers to maintain proper combustion. They were usually slow in doing so with the result that the Smoke Inspector presented the owners with a summons for smoke nuisance. A recommendation was submitted to the owners to install an electric eye in the smoke uptake. The eye was installed and connected to an alarm which would issue the most excruciating sound as soon as anything looking like smoke went by the eye. The watch engineer naturally would rush out and go after the firemen to change the damper setting. Strangely, after some time the bell was not heard any more until one day it was found that, although the boiler was smoking, no sound was heard. Somebody had opened up the box and blocked the alarm with a stick. The box was then disconnected and moved 35′ up on the wall and now the alarm went back to work. The firemen were convinced that they had to put up with it. After a short time they demonstrated with pride how they could shift burner tips without setting off the alarm. The related story, although somewhat apart from the subject, illustrates the misuse of a safety guard by some people.

Guarding of a machine towards other machines or people must also be considered. Improper flow of material to the machine, improper ejection or storage of finished products may contribute to upsetting the production and impairing the function of the unit in question, as well as affecting nearby units and their operators. If air ejection is a part of the operation, the air container may be of substandard design as compared to the operating pressure under which it operates. The tanks may not be blown down regularly, thereby throwing a heavy burden upon compressors both from a load and from a temperature standpoint. If pressure reducers are employed, safety valves set at the reduced safe working pressure should be provided on the tanks and should be tested regularly as an additional safeguard to man and machines. In fact this very impor-

. . . careful analysis of the problem at hand always opens the way to HOW to safeguard and correct an unsafe condition . . .

tant point is often violated in older plants and where revamped equipment is used. Tanks with plus and minus heads are installed with the negative head down, giving poor drainage and causing corrosion from condensation below the point of drainage. Tanks installed directly on the floor, on the negative head, also are exposed to corrosion and weakening. The procedure recommended here is to install the tank on a stand about 12" off the floor with the positive head down and the drain at the bottom.

Guarding of emery wheels is familiar and involves enclosure guards of sufficient strength to retain the fragments, with only an opening at the point of operation, 90°–125° max. of the circumference. Wheels constructed so that they can safely be operated at the available motor speed is another safeguard, this in addition to main drive protection and unbreakable shields.

Flywheels are carefully designed by manufacturers but in alteration of equipment such speeds may be exceeded. The wheel size, construction details and actual speed should be checked as a guard against rupture. Enclosures around such wheels and units protect workers from becoming entangled, however flywheel rupture makes the enclosure ineffective.

Solutions can usually be found for any guard problem and surprisingly simple ones at times. For instance, in a power plant where a large steam engine was installed as a prime mover for a generator for power, everything was perfect —with one exception. Two grease cups for two eccentrics were located directly on the eccentric bearing housings. They were honeys to catch with a grease gun. You either would hit your hand against the bearing caps or the grease gun could get caught between the eccentrics.

From our point of view we proceeded as follows:

1. We see the machine in operation.

2. We see the speed by which the grease cups move back and forth.

3. We look over the gun and we see how difficult it is for the oiler to catch the buttons with the gun.

4. We realize how easily the operator's hand can get caught in the eccentrics.

5. We realize how easily the head of the grease gun can get caught between the eccentrics.

6. Jamming or breaking the eccentrics could give a jolt to the fly wheel and generator armature putting an additional exposure on the switchboard which was in line with these objects.

7. We realized that if the grease buttons were made stationary the danger would be eliminated.

8. How could they be made stationary?

9. It could be done if the connection could be made flexible.

10. The remedy was to remove the grease fittings from the eccentrics and mount them on the stationary frame and install flexible hoses between the fittings and the grease lines.

Consideration should therefore always be given that a minimum of men and machines are exposed.

Guards of unusual design or machines that are difficult to guard may require greater ingenuity. Last year, for example, a vacuum system was developed for threading paper through feed rolls of a paper machine, a design which has proven most effective and safe. Recently in a large Supermarket a package belt conveyor was used. It was found that a serious pinch point existed between the belt and the idler rollers at the end of the belt travel. Two conveyor idler rollers, next to the belt, were provided with half bearings. If a hand should get caught the two rollers would pop out. As a further protection, to prevent a package from getting caught if the roller had been removed, an electric trip contact was installed at the end of the nearest roller. If the rollers popped out, the current would be shut off stopping the conveyor.

In another store children had a habit of riding on the conveyor. There an electric eye was installed, high enough to let packages go through but a child would interrupt the beam shutting off the power. The conveyor was also so arranged that the power circuit had to be manually reset.

Manufacturers and City and State Departments together with insurance companies and guard manufacturers all work with the same objective in mind—to make machines and processes as safe as possible for the operators, for other workers and for property. Great progress has been made and further improvements are anticipated as time goes on. Through education and instruction, workers are made conscious of the fact that they will benefit from good guarding by being able to maintain their earning power. Plant owners will realize that good guarding means uninterrupted production.

From an address presented at the 26th Greater New York Safety Convention. Picture by courtesy of Channel Master Corp.

Uniform Traffic Laws

Adoption of uniform motor vehicle laws by all the states would be "one of the most constructive steps yet taken toward cutting the nationwide traffic death toll," according to Irvin S. Markel, president, Markel Service, Inc., in a radio program interview. He expressed hope that the special committee appointed a few months ago by the Governors' Conference will come up with a uniform law plan on which all Governors will agree.

Mr. Markel said that any uniform code adopted should, among other things, call for strictest enforcement possible of the speed laws in all states; require compulsory periodic inspection of all motor vehicles; and limit the issuance of drivers' licenses to those individuals who are completely qualified to drive and have reached an age of moral responsibility. All of the 48 states must enact such laws, he asserted, because America's drivers do not recognize state boundaries.

DRIVER GETS A TICKET: Not for speeding, but an identification card as a qualified truck operator.

Safe Use of Industrial Trucks

by **G. P. CHIARELLO, Jr.**
Vice President
Pittston Stevedoring Corporation
New York City

MATERIAL HANDLING SERIES
other articles Feb., Mar.

Safety in the use of powered equipment in our operations is a vital necessity to eliminate damage to cargo, damage to equipment and, most important, personal injury. One factor that we have been stressing to achieve safety is driver qualification.

While stevedoring has its own special problems, most of the principles for using powered equipment safely are common to all industry. But before presenting our 23 rules for safe operation, I should like to mention briefly one of our special problems, namely, the continuity of driver employment.

In stevedoring it is difficult to be sure of the continuous employment of mechanical operators; but we have been identifying these employees by issuing them identification cards of a different color from the cards issued to our longshoremen. This system identifies an operator in any part of the port area. Wherever a Pittston Hiring Agent secures a driver, he will know whether the man has been a satisfactory operator previous to that day's employment.

This identification card is issued to the qualified driver after a conference between the Tractor Driver Foreman and the Pier Superintendent, as well as the Head Foreman in charge of the actual operation. After these men are in agreement as to the ability of the driver or drivers under discussion, then the Head Timekeeper is instructed to issue these special "Driver" cards and to recall their former longshore company cards. Should other firms in our industry adopt this system, I believe it could be possible for us to honor each others "Operator" cards when employing these men. I might also mention that the Army Bases and the Navy Base require that each man take a complete examination and drivers' test before he can qualify for employment as an operator by Civil Service or by a Stevedore Contractor. They also require the man to report back every six-months for a check-up test. This procedure has undoubtedly paid dividends.

Powered equipment such as the fork lift, motor tractor, and crane have become highly diversified and are continually undergoing modifications of design. Increased safety features are being built into such equipment. Despite this, however, the safety man must always examine such equipment, even that equipment embodying the newest design features, for overlooked deficiencies which might contribute to further safety hazards. In our field, the handling of cargo and the equipment used in our operation can very well be responsible for a large percentage of cargo damage as well as for personal injuries.

Careful consideration should be given to the type of material and cargo handled on a pier or in a warehouse in order to ascertain the proper type of equipment best suited to do the job. Some companies find that the introduction of materials handling equipment increases accidents and damage to a point where economies normally expected from such equipment are not realized. However, since **the human element** affects mechanical operation so closely and also is responsible for approximately 85% of the causes of personal injuries * and property damage, the proper selection and efficient training of equipment operators are the key to obtaining maximum safety and effi-

* See Editorial—page 8

Figure A: Driver must check equipment before use.

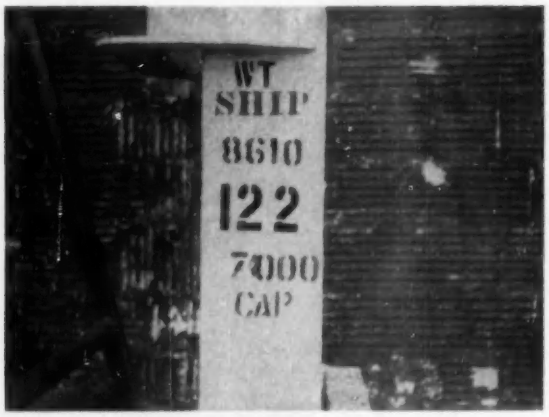


Figure B: Driver should know truck's capacity.

ciency. Our cranes and lift trucks seem slow and easy to handle; actually though, a slow-moving vehicle can cause plenty of trouble and grief if it is not properly used. Considering the loads usually handled, it takes little to cause a serious or fatal accident if there is carelessness on the part of the operator.

It doesn't matter if you use one or scores of machines, driver or operator training is of utmost importance. To help any organization maintain an effective driver or operator safety program, the accompanying operational rules should be observed and enforced by all company personnel.

Aside from improperly trained personnel, another reason for accidents caused by materials handling equipment is bad, or rather improper, maintenance. This includes such details as wobbly wheels, defective brakes, worn and stretched cable and chains, defective horns, oil leaks, and defective steering apparatus. As previously mentioned such conditions should be reported to the Maintenance Department, and that department should make the necessary adjustments or repairs at once.

The supervisor and foreman are responsible for the safety of the men working under their supervision. They are responsible for the enforcement of company safety rules and regulations. It is not enough for a supervisor or foreman to tell an employee to "be careful." He must tell him "how to be care-

(Continued on page 27)

Figure C: Extra caution is needed in high tiering.

Figure D: Lower a load slowly.

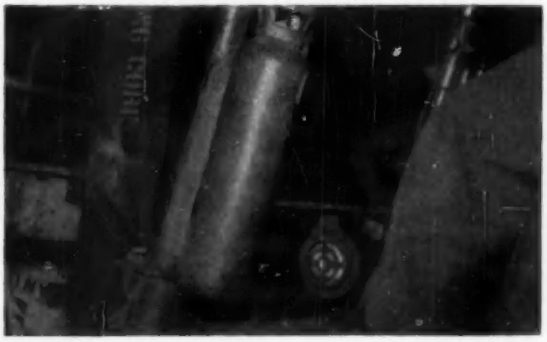


Figure E: A fire extinguisher should be on each truck.

Figure F. Driver should always face direction of travel.

23 Safety Rules for Truck Operators

1. Driver is to be held responsible for checking assigned equipment and to make certain that proper gas, oil, and water levels are maintained prior to, during, and after operation. (See Figure A)

2. Driver should report at once evidence of faulty equipment performance caused by defective brakes, steering, etc.

3. Driver should know rated capacity of the equipment; overloading is damaging and costly. Also floor load limits must be observed as well as overhead clearances watched. (See Figure B)

4. Driver should watch blind corners, stop at intersections, and sound horn. The other fellow cannot see around the corner either.

5. When operating a lift truck, loads should be lifted, lowered, and carried with upright vertical or tilted backward—never forward.

6. Under no circumstances are unauthorized riders permitted on equipment.

7. Driver should watch rear end swing and use low gear when descending ramps or steep grades.

8. A driver should never "butt" loads with forks or rear end of truck. This practice usually causes cargo damage and personal injury.

9. Care should be exercised when high tiering. There are no profits in fallen cargo that becomes damaged. (See Figure C)

10. Driver should keep arms and legs where they belong. Never place them between the uprights of the mast or outside the running lines of the vehicle.

11. Driver must not use any fork lift as a personnel elevator unless there is a safety platform attached to the forks.

12. Driver should operate at authorized speeds. Flying starts and screeching stops cause trouble.

13. Switch keys should be turned off when equipment is left unattended. Weight of vehicle should be stenciled on two sides.

14. Loads should be lowered slowly and stopped gradually and should never be lifted or lowered while equipment is in motion. (See Figure D)

15. Fire prevention rules should be observed. Fire extinguishers should be on each piece of equipment and each driver should know how to operate them. (See Figure E)

16. Sudden stops should be avoided. They can cause spilling of cargo, personal injury and/or equipment damage.

17. Driver should always face in the direction of travel for better vision. (See Figure F)

18. Driver should make sure that bridge plates into trucks or freight cars are sufficiently wide, strong, and secured properly.

19. When leaving equipment, driver should be certain that brakes are set and holding.

20. Driver should travel carefully over rough spots and accelerate and decelerate machines gradually.

21. Driver should be taught to treat equipment as he would his own car. He should also be instructed to use care, common sense, and courtesy at all times.

22. Driver should never permit anyone to handle or drive equipment assigned to him.

23. All employees should report accidents to supervisor or foreman immediately.

How much solvent will produce the maximum allowable concentration for that solvent, when vaporized in a room 10 ft. by 10 ft. by 10 ft. (1000 cubic feet)?

You Can Do More About Solvent Safety

by **JOHN B. MOORE**
Technical Director
John B. Moore Corporation
Nutley, New Jersey

Even a little solvent can make a lot of trouble, but in some industries there is a large proportion of workers who are required to use solvents. If you give your workers a container of fluid that has the potential power to maim or erase life or to cripple or destroy the plant, then it should be clear that there are no odds in favor of anyone, unless definite and sure controls are installed and enforced.

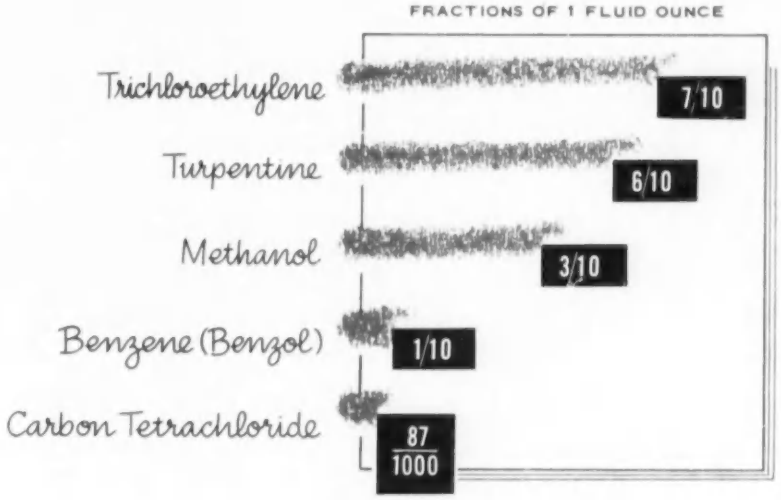
One thing is certain: **solvent safety is attainable and the measure of success is directly proportionate to the effort expended to get it.** It's as simple as that! But it is also reasonable to question how many safety and production personnel fully appreciate the magnitude of the problem and the consequences of failure to control solvent hazards.

It has been the author's privilege, as a consultant, to survey a number of industrial plants and to have assisted safety, hygiene and management functions in reducing the potential hazards of solvents. The case history of one such company, typical of the electrical equipment field, will be found on the opposite page.

While the fire and explosion hazard potentials of solvents have been so widely publicized that their dangers are matters of public acceptance, the same cannot be said of their health hazards. It is true that yeoman service has been rendered to this cause by safety and hygiene groups, as well as by medical and chemical authorities, but there is still no general appreciation of how little solvent it takes to make an appalling amount of trouble. Let's see how dangerous some common solvents really are.

The Council on Industrial Health of the American Medical Association recently issued a pamphlet, "Hazards of Solvents, At Home—On the Job," [1] in which commonly used solvents and their hazards are described. Some figures of dramatic significance warrant repetition here. These figures show the actual quantity of solvent fluid which, when vaporized in a room 10′ x 10′ x 10′ (1,000 cubic feet), will produce the maximum allowable concentration for that solvent in parts per million of air: Benzene (Benzol)—0.12 fl. oz.; Methanol—0.32 fl. oz.; Trichloroethylene—0.70 fl. oz.; Turpentine—0.61 fl. oz.; Carbon Tetrachloride—0.087 fl. oz.

Many safety engineers with whom these figures have been discussed have expressed amazement and, quite properly, concern. If these men, who are trained to assess such risks are amazed, should it be surprising that John Q. Worker is frankly so skeptical? After all, he can visualize a flash fire and picture himself on the receiving end. Chronic solvent poisoning, how-



ever, is slow, insidious and seldom dramatic, so the worker admittedly is hard to sell. Yet, sell we must—we have no choice!

It would be a waste of time to indulge in arithmetical acrobatics merely to dazzle with large figures, but the danger is there and it is very real. Every company that uses solvents should reappraise the situation in its plant: first, to determine whether there is control of solvent hazards; and second, to determine whether all solvents are under proper control. There are remarkably few plants that can answer affirmatively to the second question. *(Continued next page)*

CASE HISTORY: The Solvent Control Problem Found in the Survey of a Typical Plant

The organization employs slightly over 4,500 persons, of whom about 600 are classed as non-manufacturing, such as clerical and administrative personnel. A solvent audit was made and disclosed purchases of approximately 90 thousand gallons in the year 1955. In other words, the annual use of solvents per worker was 20 gallons. Assuming the plant has a normal operational rate of 200 work-days per year, the solvent consumption rate averages 450 gallons per work-day, or one/tenth gallon per worker per work-day.

Also assuming the non-recovery of 50 percent of the solvents used, as represented by evaporation loss, there is then a total of 225 gallons of solvent vapor released as a source of atmospheric contamination in each eight-hour period of work operations.

Analysis of the solvents by chemical types revealed that:

- **75% of the yearly 90 thousand gallons was more volatile than toluene.**
- **90% of the 90 thousand gallons represented health hazards at levels in excess of 200 parts per million, maximum allowable concentration.**
- **70% of the 90 thousand gallons presented fire or explosion hazards within or below the range of naphthas.**
- **Over 50 different products were carried in stock and these were obtained from an equal number of supply sources.**
- **Over one third of the items were identified only by number of proprietary origin, and precise formulation ingredient data was not a matter of record.**

What is the relation between the daily consumption figure of 225 gallons and the cubic capacity of the plant itself? The capacity of the total building, including offices, rest rooms, cafeterias and storage areas, is 15,600,000 cubic feet. The evaporation of 225 gallons of solvent produces sufficient vapor to contaminate 41 million cubic feet of air at a level of 200 parts per million. The hourly average per work day would amount to 5,150,000 cubic feet at 200 ppm; or, in this plant, we can assume a constant level of evaporated solvent equal to 70 ppm as the normal load on plant ventilation equipment.

Since it is obvious that solvent vapors are not equally distributed, but are more concentrated in and around points of emanation, it is equally apparent that a major breakdown of the plant ventilation system may be disastrous in effects, both on workers' health and in lost production.

How to Set Up a Solvent-Hazard Control Plan

Step 1: Get the Facts

Among the several requisites which are fundamental to the success of a safety engineer is the talent for salesmanship. Any solvent-hazard control plan must be sold. To do a proper selling job requires work, study and perseverance. Most managements are from Missouri. They have heads and they have hearts. Salesmanship consists of presenting facts which point logically to sound objectives to be gained by a proposed course of action. This is the appeal to the head. Logic, however, will not alone produce action. There must also be a motivation, whether it be pride, monetary gain, humanity, fear, or something else. It is emotion which provides the excuse to act, however reasonable the course of action proposed may be.

How, then, can you inaugurate a solvent-hazard control plan? First, by digging out the facts. Simple as that may sound, it is probably the most difficult and often frustrating part of the job. There are three primary sources from which this data may be secured: Purchasing, Stores, and Operating Sections.

PURCHASING: In your initial survey it is not likely that Purchasing will be able to give adequate or accurate information. They are not always in a position to recognize a solvent by definition, hence may omit specialties such as typewriter cleaners, duplicating machine solvents and laboratory supplies. The most practical initial approach is to require all departments, including clerical laboratory, customer service and maintenance, to complete a detailed questionnaire.

OPERATING SECTIONS: This departmental questionnaire may be set up on a duplicated form which asks at least six basic questions:

List all solvents used in previous 12 months.

Show total quantity of each solvent used in this period.

Show average normal quantity kept on hand at point of use.

Describe or name specific uses for each solvent.

Describe where, how and when each solvent is used.

State (a) from whom solvent is requisitioned, and (b) which buyer is responsible for the purchase.

On the questionnaire there should also be space for comments of the supervisor or foreman as follows:

Do you have, or have you had, complaints about:

(a) Unpleasant or irritating solvent odors

(b) Skin, eye or body irritation from solvent contact

(c) Fires, or near-fires

Do you feel that:

(1) Ventilation is adequate

(2) Protective equipment is needed

(3) There is room for improvement in:

(a) The solvent

(b) The method of use

(c) The means of dispensing the solvent.

You will find that a large percentage of returns will be moderately accurate and conscientiously completed. The remainder (which will have to be dug out the "hard" way) will be a mixture of fact and fancy that only patient, on-site, detective work can unravel.

STOREHOUSE RECORDS: While the fact-finding questionnaire to the operating sections is "in the works," a detailed study of storehouse records should be made. This should be compiled as a list which shows:

Name of solvent, or other identification

Source of supply

List of all departments and sections which draw against stocks

Total withdrawals in previous 12 months for each department or section per product

It has been my observation, at about this point, that the safety engineer begins to look anxiously over his shoulder and develops a noticeable tic or other symptom of insecurity. This is quite understandable because cold figures can give one chills.

After arranging completed section questionnaires in departmental groups, it might be advantageous to make up a summary sheet for each department. This should show essentially the same information as received from stores. It is not essential that the section and departmental figures be reconciled with those from stores. What is important is the elimination of the discrepancies which are the symptoms of lack of control. It is also at this point that confirmation of data may be secured from Purchasing, for it is now known what solvents have been bought and what buyers are responsible for the placement of orders.

Of course in examining questionnaires, certain of them will reveal the need for immediate action to correct obvious hazards. This action should be taken, but the recommendation for relief of those situations should be consistent with the general control program that is intended for the plant as a whole.

If this precept is not followed, you may find yourself involved in endless explanations over apparent inconsistencies. It is fallacious thinking to presume that your management is any better educated than are your plant employees when it comes to solvent hazards. To each, in his own language, the hazards must be spelled out, and as well, the measures by which the hazards must be controlled.

The management wants a safe plant because a safe plant is a more profitable plant than one which has a high loss factor. The employee wants a safe place to work so he can produce more, get paid more, and if he must go home tired, at least he doesn't go home sick and tired from his job.

Step 2: Evaluate the Solvent Hazards

Up to this point we have been concerned with the problem of setting up an inventory of "liquid tools"—solvents. It has been largely a one man operation. From here on, solvent hazard control must become a team function. The team membership should represent all interested parties—personnel welfare, plant protection, purchasing, engineering and operations, with the safety engineer serving as the captain of the team. Steps should be taken, in co-operation with the medical department, to evaluate the

occupational health hazards associated with the solvents individually listed in the inventory. Those proprietary products which are blended or mixed formulations should be given particularly close scrutiny as to the natures and percentages of their ingredients. If these data are not known, information should be requested of their vendors. It is important that such data be asked for and kept in confidence. If the vendor refuses to make disclosure, then decide whether that particular solvent is so necessary to operations as to justify the cost of laboratory analysis. If it is not, then effort should be made to find a suitable replacement about which there is sufficient known data to permit the intelligent hazard control measures.

An often overlooked, but vital, focal point of "solvent hazarditis" is the research laboratory—and, as well, the quality control laboratory. Once a specification is written which calls for "solvent A," it is, in many instances, a task of monumental proportions to effect the change orders necessary to substitute the less hazardous, the equally effective "solvent B." It is wise therefore, to do two things: (1) Invite these functions into the teams, and (2) See that their laboratories are stocked with samples of all materials in use, as well as those for which early use is contemplated. Where there are new or altered processes which involve the use of solvents, set up procedures that will enable safety to function in its role of accident prevention, instead of conducting post mortems.

In this spirit of accident avoidance, there is one more suggestion which is important. It requires the co-operation of all team members, but need not be unduly burdensome. It is to insist that all new solvent products which are offered by vendors, or requested by interested departments, be submitted first to the safety department, so that their properties and hazard levels may be determined or estimated beforehand in the light of their proposed use. By this means the safety function is alerted to possible changes in operating conditions, and has both time and information with which to establish effective controls for utilizing the proposed solvents safely.

Step 3: Dispel the Ignorance About Solvent Hazards

In many industries, electrical equipment for example, the problems of solvent hazard control are complex, because of the diversity of materials used and of the wide variety of operations in which their use is required. It follows, then, that a successful control program cannot be a one man job. It must require teamwork. Not only teamwork from those who manage and supervise, but from those who use and dispense solvents as well. This points up the need for education, both of those who use and dispense, and of those who manage supervise and specify solvents.

The plant worker or assembly technician cannot be expected to recognize on sight the health and fire hazards of solvent chemicals. He assumes, too often falsely, that those of more advanced training—engineers, chemists, yes, and even medical doctors—are so equipped. That this assumption is not always true is sad commentary of those of our colleges and universities who, by example and omission from curriculae, exclude health concepts from their laboratories and lectures.

As a starting point for education, I strongly recommend the use and application of the "Guide for the Preparation of Warning Labels," Manual L-I, now available as the third revision.[2] It is published by the Manufacturing Chemists' Association, Inc., Washington, D. C. and may be secured at a cost of one dollar per copy. It is the result of the fine co-operative work of the Manufacturing Chemists' Association, the American Medical Association and the National Safety Council.

Vendors should, of course, label their products in a manner appropriate to these tenets. But, further than this, all solvents, when re-distributed throughout your plants, should be transported and dispensed in containers which carry hazard notice labels, consistent to the product. You may expect initial reactions of fright and some bewilderment and must, therefore, be prepared with facts to sell the idea that these measures are primarily to enable the person exposed to recognize that a hazard does exist, and to enjoin him to exercise due care in his own behalf.

It might be noted that this last suggestion would assist materially in carrying out another, and most meritorious project—Home Safety. Industry is doing a wonderful job here. But, despite all efforts, almost daily in the local press tragedies are recorded in which solvents and children are a part. Many of these, which involve commonly available materials such as kerosene, gasoline, carbon tretrachloride, naphtha, benzene and turpentine, might have been avoided. Certainly some need not happen at all, provided that parents, who are your employees, are taught about their hazards.

If this seems far afield and, to an extent altruistic, I would remind you that the emotional impact, time and productivity loss of a home accident is felt not only in direct dollars and cents in your plant from that employee's suffering, but in reduced efficiency and disturbance of those with whom he, or she, works. I have often been in homes where carbon tetrachloride is used freely as a spot remover, and have been told defensively, that that is what they use at work. In effect, "My Boss wouldn't let us use it, if it's as dangerous as you say."

In all humility, I suggest there is a moral here which denies the contention of some who boast that they leave their work at the plant when they go home. Deep in our hearts, we, who are in safety work, know that our failures—to teach, to indoctrinate, to show by our own example and attitude, proper safety practices at work—are too often reflected in accidents at home. Let us, then, be humble when we show improvement in our plant statistics on frequency and severity rates. The question is not, "What more could we have done?", but rather **"Could we have done more?"**

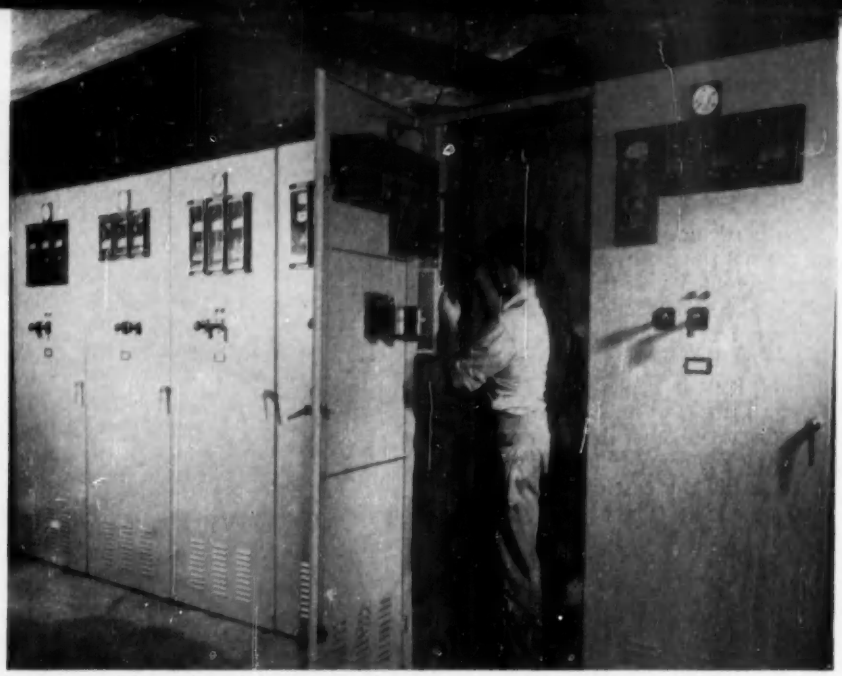
From an address presented at the National Safety Congress.

1. "Hazards of Solvents, At Home—On The Job," Council on Industrial Health, American Medical Association. A pamphlet consisting of 8 pages.

2. "Warning Labels," third revision, Manual L-I, Manufacturing Chemist's Association, Inc., Washington, D. C.

Vital Point: All new solvents should be first submitted to the safety department so that future dangers can be foreseen.

tips on switchgear upkeep



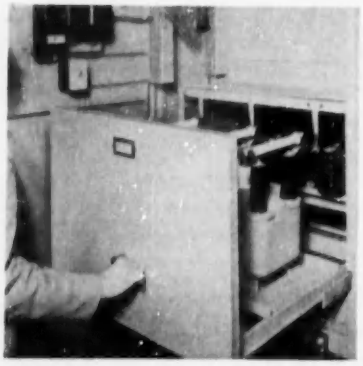
In modern switchgear, hinged door gives ready entry to metal-clad compartment. Leads from panel-mounted devices end at an easily accessible terminal in compartment.

A regular maintenance schedule should be established to obtain the best service and reliability from the switchgear. Plant, operating and local conditions will dictate the frequency of inspection required. A permanent record of all maintenance work should be kept, the degree of detail depending on the operating conditions.

Switchgear Structure

The following operations should not be undertaken until it is certain that the equipment is completely de-energized:

1. Thoroughly clean, removing all dust and other accumulations. Wipe clean the buses and supports. Inspect the buses and connections carefully for evidence of overheating or weakening of the insulation.
2. Measure the resistance to ground and between phases of the insulation of buses and connections. A high potential test is not required and is not recommended, but if it seems advisable, based on the insulation resistance tests or after repairs, the test voltage should not exceed 75% of the AIEE factory test voltage. The potential transformers must be disconnected during the high potential testing.
3. Clean breaker position changing mechanism, lubricate, and check for proper operation.
4. Check primary disconnecting device contacts for signs of abnormal wear or overheating. When necessary clean contacts with silver polish. Before replacing breaker, apply a thin coat of contact lubricant to breaker studs for lubrication.
5. Check to see that all anchor bolts and bolts in the structure are tight. Check tightness and continuity of all control connections and wiring.



Potential transformers and primary fuses are mounted on drawout carriages, saving time.

In this picture the relay is being withdrawn from switchgear panels preparatory to test.

Instrument Transformers

These should be inspected to assure they are in proper condition, and that the potential transformer fuses are intact.

Meters and Instruments

They should be examined to assure they are in good condition,

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registering properly, and have no broken or cracked glass or scarred or damaged cases. Watthour meters should be tested and calibrated, if necessary. A meter technician should examine meters and relays at least once a year. If the plant maintenance staff is not equipped for this work, manufacturers' service shops can supply this service.

Control and Instrument Transfer Switches

The transfer switches and contacts should be checked for proper operation. Damaged parts should be repaired or replaced. When the equipment controlled by the switch is infrequently operated, this inspection should also include the operation of the controlled device.

Indicating Lamps

These lamps should be examined and burned out bulbs replaced immediately. The operation test of controlled devices should include checking proper indication by the lamps of the "open position" and the "closed position" of the power circuit breaker.

Voltage Regulators

The voltage regulators should be checked carefully, and readjusted if necessary.

Circuit Breakers

1. The movable and stationary primary contacts and the movable arcing contacts should be inspected. If the contacts are burned or pitted, they should be made smooth with a fine file. After completing inspection of the contacts, check the contact adjustments.
2. A careful inspection of the breaker operating mechanism should be made to check for loose nuts or bolts and broken retaining rings. All cam, roller, and latch surfaces should be inspected for any evidence of damage or excessive wear. Check the mechanism adjustments and all terminal connections.
3. The breaker should be lubricated at each periodic inspection and also whenever it is overhauled. After lubricating the mechanism, use the maintenance operating de-

Trouble - Shooting Chart

CAUSE	REMEDY
Watthour Meters Inaccurate	
Meter may be dirty or choked with dust accumulations; there may be magnetic particles adhering to the magnets; meter may be damaged—have a cracked jewel, rough bearing, bent disk shaft, insufficient disk clearance, marred gears or worm mechanism, damaged coils, or loose connections.	Clean meter or repair or replace faulty parts. Test and calibrate. NOTE: Should not be attempted by unqualified persons. If plant's maintenance staff is not equipped for this, the nearest manufacturers' service shop can supply this service.
Noises Due to Vibrating Parts	
Loose bolts or nuts permitting excessive vibration.	Tighten.
Loose laminations in cores of transformers, reactors, etc.	Tighten any loose nuts or core clamps.
Connections Overheating	
Increase of current due to additional load that is beyond normal current rating of bars or cables.	Increase the carrying capacity (increase the number or size of conductors). Remove excess current from circuit.
Bolts and nuts in the connection joints not tight.	Tighten all bolts and nuts. Too much pressure must be avoided.
Damaged Control, Instrument Transfer Switch or Test Blocks	
Burned or pitted contacts from long use without attention or from unusual conditions.	Dress or clean burned contacts, or replace with new contacts if necessary.

For Switchgear Equipment

CAUSE	REMEDY
Failure in Function of All Instruments and Devices Having Potential Windings	
Loose nuts, binding screws or broken wire at terminals.	Tighten all loose connections or repair broken wire circuits.
Blown fuse in potential transformer circuit.	Renew fuses.
Open circuit in potential-transformer primary or secondary circuits.	Repair open circuit and check entire circuit for intactness and good condition.
Relays Failing to Trip Breakers	
Improper setting.	Adjust setting to correspond with circuit conditions.
Dirty, corroded or tarnished contacts.	Clean contacts with knife or file. Do not use emery or sandpaper.
Contacts improperly adjusted.	Readjust so that contacts close with proper amount of wipe.
Open circuits or short circuits in relay connections.	Check with instruments to ascertain that voltage is applied and that current is passing through relay in question.
Improper application of target and holding coil.	Target and holding coils should correspond with tripping duty of breaker to assure proper tripping.
Faulty or improperly adjusted timing devices.	If timing device is of bellows or of oil-film type, clean and adjust. If of induction-disk type, check for mechanical interference.
Meters Failing to Register	
Blown potential-transformer fuse.	Renew blown fuses. If necessary, ascertain reason and correct trouble.
Broken wires or other fault in connections.	Repair.
Wedge or block accidentally left at time of test or inspection.	Remove wedge or block and see that meter is in good operating condition.

vice, opening and closing the breaker several times to make certain that the mechanism operates freely throughout its entire stroke. It is also recommended that all circuit breakers be operated at regular intervals to insure that the equipment is operating freely.

Material by courtesy of the General Electric Co.

Safe Use of Industrial Trucks

(from page 18)

ful." The employee of a company has the responsibility of observing and complying with the company safety rules. It is part of his job.

Tonnage and efficient operation can only be accomplished through the cooperation of the supervision and the employees. Safety cooperation and tonnage go hand in hand between management and labor. All personnel should be alert to all possible interference and potential hazards relating to the activities of third parties (i.e. guards, repair men, crew, etc.). Such individuals should be politely advised to remain clear of stevedore operations to avoid personal injury. The surface of all areas should be dry, and should it be necessary to operate during rain, snow, or distressed conditions, extreme measures should be taken to sand or treat the floor surface.

When gas driven fork trucks are used in the hold of ships, some very important rules must be followed. The accumulation of carbon monoxide can be deadly, and frequently serious results have been experienced. Two important recommendations should be followed. First, a catalytic exhaust should be installed on this equipment. Secondly, portable blowers should be used in order to keep fresh air circulating in all parts of the cargo compartment at all times. The investment for the blowers is a wise one inasmuch as these same blowers may be used when the summer heat makes it impossible to work.

Finally, where company supervision shows the most interest and exerts the most effort for good housekeeping and frequent safety meetings, the company usually has the most success with the mounting problems we must face in this era of mechanization.

From an address presented at the 26th Greater New York Safety Convention. Pictures by courtesy of Pittston Stevedoring Corp.

National Safety Congress

(Highlights from speeches at the 44th National Safety Congress.
Continued from the December issue of "SAFETY MAINTENANCE")

Welding of the future will be even hotter than it is right now, was the prediction made by John J. Ferry, General Electric Co., Schenectady, N. Y.

In 1948, Ferry said, the hottest known welding flame was 4,200 degrees, centigrade. Recent research has stepped this up to 5,600 degrees, using such fuels as carbon subnitride-oxygen. He said an oxy-aluminum torch which can cut concrete has already been developed commercially.

"Welding engineers are always interested in new, high temperature sources," Ferry said. "It is safe to assume that as soon as these sources can be maintained and controlled properly, they will be considered for welding."

Working Habits

Hazardous jobs usually are safer than routine ones, pointed out Glen Latshaw, safety supervisor of the Northwestern Bell Telephone Co., Minneapolis, Minn. He also suggested that by observing the individual's work operations during the progress of a job, so-called minor bad habits can be spotted.

"Peculiar as it may seem, the large majority of serious or fatal injuries occur on everyday, routine jobs and mostly are caused by supervisory countenance of the so-called minor wrong habits," Latshaw said. "On jobs where extreme hazards are obvious to all concerned, we seldom have serious or even minor injuries."

Two rules, originated years ago, are still good for conveyor belt safety, according to W. A. Hyde, assistant superintendent of maintenance, Oliver Mining Division, U. S. Steel Corp., Virginia, Minn. The speaker pointed out that statistics show the most hazardous spots on a conveyor are the main course of the belt and the belt take-ups, and that 84 percent of accidents occur in cleanup operations.

"We developed two safety rules for general guidance," he said. "The first rule requires lockout of belt drives for any maintenance work. The second rule requires personnel to do cleanup work on downtime where possible. These are not new, but they are still 'good-as-new!'"

How to hold a door shut with a railway train was described to the National Safety Congress by the assistant mine superintendent of the Copper Queen Mine in Bisbee, Ariz. Henry D. Clark of the Phelps Dodge Corp. said developing safeguards is a primary consideration in the company's safety policy.

An automatic door guard, for example, is installed at points where doorways give entrance into areas of mine railway operation, he said. To prevent men inadvertently walking into the path of an oncoming train, he said, the door guard automatically bars the doorway until the road is clear.

Other devices Clark described included pulley block guards, a slack rope indicator on hoists and a safety trolley wire cutout.

"Sound" safety measures—both literally and figuratively—are improving efficiency and preventing accidents in the mining industry. The use of a sound-powered telephone and a "talking hoist cable" was described by Robert W. Edwards, superintendent of the Morris Mine of Inland Steel Co., Ishpeming, Mich.

This type of telephone was developed originally by the Navy during World War II for fire communication aboard ship. Its main advantage for mining operations, according to Edwards, is that it works without electrical power added.

The "talking hoist cable" makes possible the use of sound-powered phones in voice communication between the cage and the hoistman in mine elevators, he said. The connecting wires are wound right into the hoist cable, he explained.

H. C. Bent, safety engineer of the Noranda Mines, Ltd., of Noranda, Que., described some of the procedures necessary to fight fires in mining operations. To minimize the effects of dust explosions, he said, all levels and openings of the area are thoroughly wet down. In addition, fog sprays are turned into the area and ventilation doors in danger of damage are opened.

Although all rope, tools and powder bags are treated beforehand to render them fire-resistant, such articles, plus scrap wood and other combustibles are removed before blasting, he said.

Electrical Fires

To prevent electrically ignited fires, Bent said, main power distribution cables are wrapped with armored steel wire, which is grounded as an added precaution. He said miscellaneous signal, telephone and blasting lines are being replaced with lines protected with fireproof jackets.

All transformers and underground switches are installed in concrete vaults equipped with fire extinguishers, he said. The transformers are filled with a fire-resistant material, he pointed out.

"While our record speaks well for the efficiency of the preventive measures adopted, the occurrence of occasional fires repeatedly reminds us of the need for constant

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vigilance and of studying methods of improving our preventive measures as well as evacuation procedures."

More accidental deaths occur in farming than in any other occupation, and the death frequency rate is exceeded only by mining and construction, according to the chairman of the Orthopedic Section of Mayo Clinic, Rochester, Minn. Dr. H. Herman Young said statistics do not tell the whole story since not all farm accidents are reported.

Reporting on farm injuries treated at Mayo Clinic, he said most injuries were caused by falls, farm machinery and livestock, in that order. In addition, records showed that injuries occur in the farmers' most productive years. The average age of those injured, he said, was 39.

Recent Developments

"Bleeder entries" is not a surgical technique, but a new method of ventilating mine areas to minimize the gas hazard. Donald Kingery, assistant chief of the Bureau of Mines mine ventilation section, Pittsburgh, Pa., announced some test results on the effectiveness of bleeder entries during a speech before the 44th annual National Safety Congress.

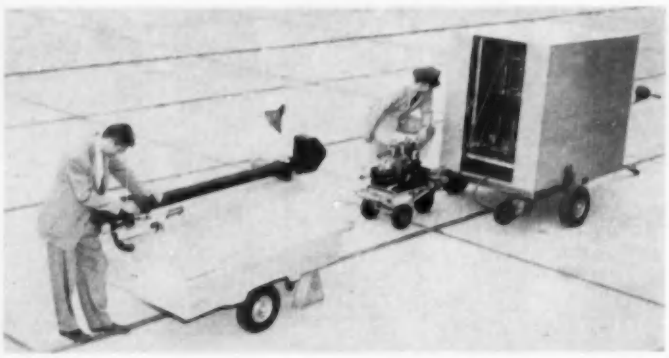
He described "bleeder entries" as special air returns designed to drain off air-methane mixtures from inactive mining areas.

"Based upon the results of these tests, it is concluded that in most applications, provided the bleeder ventilation system has been well planned and the bleeders are reasonably clear of obstructions, a bleeder system of ventilation will reduce the hazard of dangerous accumulations of mine gases being released into active working areas," Kingery said.

LP Gas Safety

LP gas, a liquid that boils at 44 degrees below zero, is making it possible to use internal combustion engines safely inside manufacturing plants. G. W. Keller of the Ensign Carburetor Co., Huntington Park, Calif., told the convention that liquid petroleum gas is safer as an engine fuel than gasoline if properly handled. He said

(Continued on page 32)



At left, technicians adjust the light beam on the stationary unit of the runway profile device. The recording unit, at right, is towed down projected light beam.

Runway Roughness Indicator

Some of the hardest punches modern airplanes must take come on the ground. Able to whip through the sky at supersonic speeds and breathless altitudes, the aircraft still face one of their toughest structural tests when they taxi out on a runway for a takeoff.

The roughness inherent in present runways literally makes the heavy and flexible airplanes "rock and roll"—setting up vibrations which tend to tear them apart. As aircraft become heavier and as they taxi for takeoff at higher speeds, the destruction wrought by runways becomes an increasing problem.

Air Research and Development Command engineers design and build aircraft stronger then necessary. It is insurance against damage by runway roughness but adds weight which cuts down performance.

A new device, developed under contract for ARDC's Wright Air Development Center, may alter this situation. The new development is a vehicle that takes a statistical picture—actually a profile—of the runway.

A fixed beam of high-intensity light, four inches in diameter and created by a zirconium arc, is projected the length of the runway from a stationary unit. A recording vehicle is towed along this beam. A set of photo-electric cells in the vehicle "locks" onto the light beam and rides it to the far end of the runway. Every one-half foot along this course a magnetic tape recorder charts the vertical distance from the beam of light to the runway surface, thus producing a profile of the runway.

These statistics are then reduced to a simplified series of numbers, fed into a computer, and transformed into a curve. The resulting curve is actually a plot of runway power versus frequency, that is, it shows the runway's tendency to create airplane vibrations. An airplane's response to these frequencies of vibration is already known.

When this responsiveness is compared with the runway's tendency to cause vibration, the forces produced on and within the airplane structure can be determined. Research is now being conducted to allow prediction of the amount of damage produced by these forces.

Before development of this device by the Midwest Research Institute, Kansas City, Missouri, the Air Research and Development Command had no sure way of predicting what damage a runway would do to a specific airplane. The new runway profile device has been used successfully at three Air Force bases to date.

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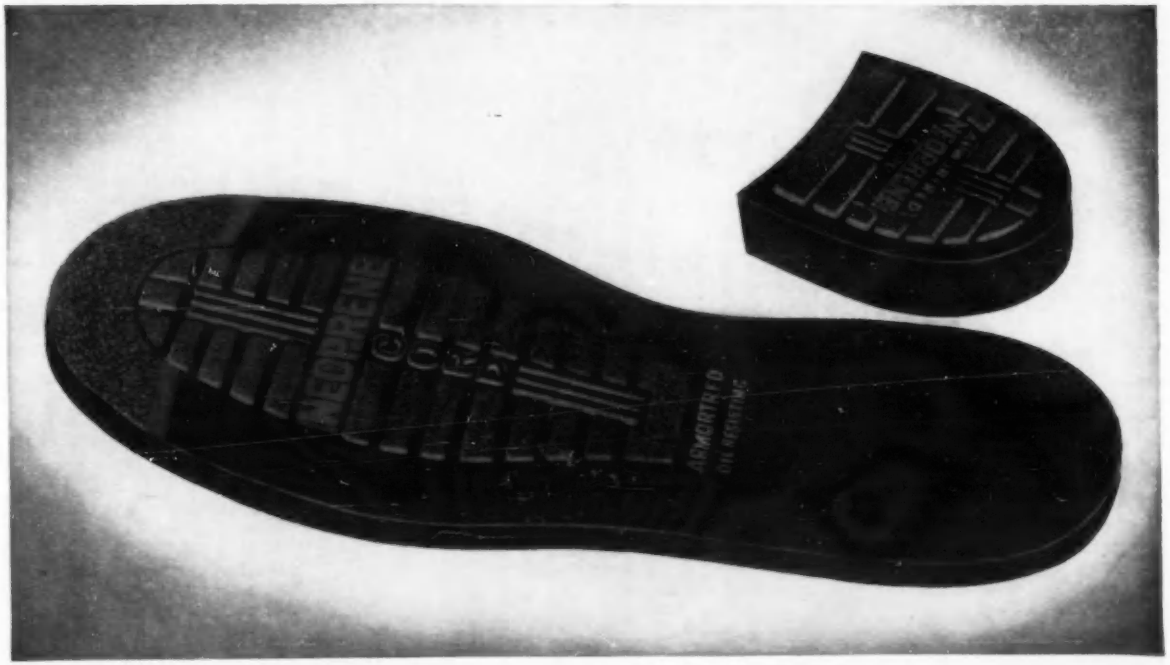

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(Use Key # Z-12 on Inquiry Card on page 75)

that the gas is safer and better as a fuel because: 1. Fuel evaporation and spillage is eliminated, 2. Exhaust gases are clean and not obnoxious, 3. Refueling is quick and safe, 4. LP gas burns with little carbon formation, 5. Engine wear is reduced and lubricating oil life lengthened by more than 400 percent.

On the other hand, LP gas powered industrial trucks can do a bang-up job, but they will go up with a bang if not used properly, warned P. E. Johnson, standards engineer, Factory Mutual Engineering Division, Norwood, Mass.

He said the inherent hazard of liquefied petroleum gas is one of explosion, since it can develop into an explosive gas-air mixture when released into a building.

"Improperly safeguarded, carelessly operated or haphazardly maintained, the LPG truck can cause loss of life, property and production," he said. "This is not a new principle. It applies to everything we use today and will apply to everything that is developed in the future."

Housewives of the future will be able to burn up kitchen smells instead of getting burned up at them! That was the prediction of Berton Karol, chief engineer of the automotive division of Oxy-Catalyst, Inc., Wayne, Pa. Karol told how a coil of chemically-coated wire can be placed in the vent of a kitchen range to literally burn up the odors and smoke of cooking.

"The fumes, cooking odors and smoke from broiling steaks, or any other food preparation, pass through the coil and are oxidized and eliminated before being emitted in the room," Karol said. One of the largest range manufacturers is now using the coil in its top line of ranges, he said.

Odor Control

"The possibilities of extending the use of this catalyst to air conditioning and other devices for air purification in the home are excellent since this catalyst is equally efficient for the removal of bacteria, pollen, cigarette smoke and other air impurities," he said.

Karol said that his company has manufactured catalytic oxidizers for some time for use on factory lift trucks in order to safeguard operators and other workers from the dangers of carbon monoxide and hydrocarbon fumes and odors.

Machinery safety guards do more than just keep a workers fingers out of danger. E. J. Mulligan, safety director, Aluminum Co. of America, East St. Louis, Ill., said guarding every possible source of injury around machines is one of the best ways for management to express sincere interest in employees' safety.

Training, education and supervision are necessary, he said, to discourage attempts on the part of workers to short-circuit the effectiveness of guards.

"The main motivating force in a safety program generally is wrapped up in three words—morale, education and discipline," Mulligan said. "When these three components are blended together properly, you will usually find an excellent safety record."

Safety Is Profitable

What ailing industries may need is a good dose of accident prevention. This "prescription" was given by Frank W. Marcaccio, chief of industrial inspection, Rhode Island Department of Labor. He said the job of an industrial safety engineer is similar to that of a doctor. The frequency rate of accidents is the engineer's "fever thermometer."

It takes diagnosis to figure out why accidents are happening, he said. And, just as the doctor prescribes treatment for illness, so does the engineer recommend corrective action for accidents, he said.

Analysis shows that **profitable plants are those without excessive lost-time accidents, Marcaccio pointed out. "The most surprising fact in this analysis is that the plants operating profitably show a good-size budget for accident prevention,"** he added.

An industrial emergency such as a fire or explosion may not always be preventable, but panic afterwards certainly is. Roy A. Blank of the petroleum chemicals division of Du Pont at Wilmington, Del., told the National Safety Congress how disaster and emergency procedures set up in advance can eliminate most causes of panic.

The broad objective of an emergency plan is to prevent disasters that can possibly be averted, he said. The secondary aim, he pointed out, is to prevent injuries and save lives, reduce property damage and provide continuity of operations.

In setting up a plan for emergency procedures, Blank included the following considerations: warning signals, evacuation, rescue operations, fire brigades, control center, emergency communications, medical assistance, mutual aid from neighboring plants, stand-by power, decontamination measures and provisions for keeping the public informed of what's going on.

Safety is a personal thing, according to R. O. Breaud, safety supervisor of Pan-Am Southern Corp., Destrahan, La.

He said a survey of company accidents revealed that more than 90 percent were caused by personal errors rather than faulty equipment. Therefore, it was decided to get at the cause by improving communication to the worker, he said.

He described the promotional and educational devices used: tool box lectures, personal safety interviews with new employees, and safety contact slips issued when a foreman instructs a worker in the safe method.

The attitude that "rules are rules" and need only to be followed to eliminate all accidents is out of date.

"Individual safety largely depends on a worker's constant alertness, not reliance on rules and man-made devices, said J. W. Adams, manager of production planning for the Louisville & Nashville Railroad Co.

Many people spend years talking about how things should be done to provide safety for everyone, he said. Suddenly, however, they become aware they haven't kept pace in observing drastic changes in the ways of life taking place around them every day, he said.

This special report on the important National Safety Congress will be continued in our next issue.

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in a practical program of

industrial hearing conservation

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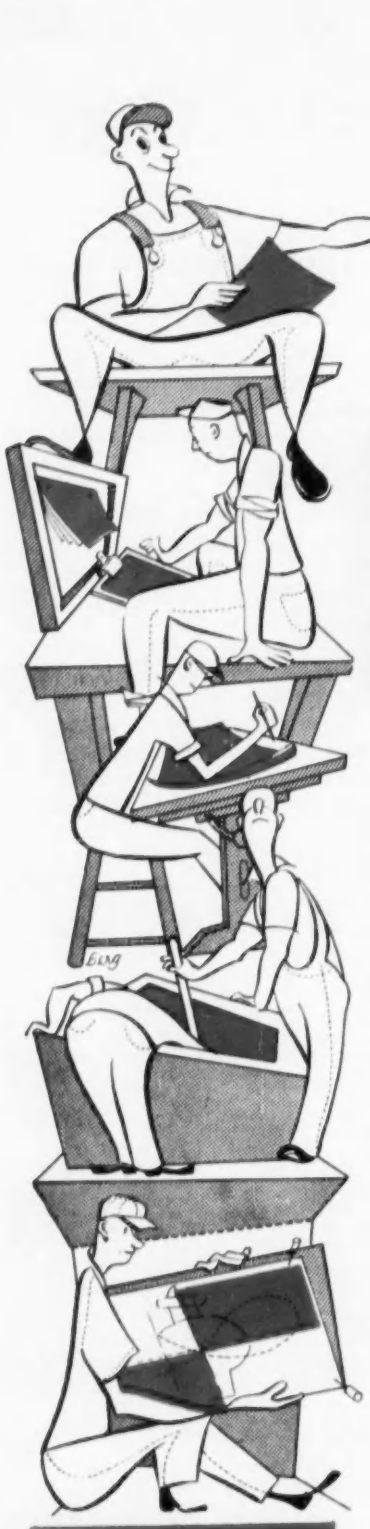
(Use Key # Z-13 on Inquiry Card on page 75)

KEEPING UP WITH



FLOOR MAINTENANCE SERIES
other articles Nov. and Dec.

WOOD BLOCK COLD ADHESIVE

An improved type of cold adhesive for fast resetting, repairing and resealing of wood block floors, has been announced by The Monroe Company, Inc. Known as Blockset, the new material is factory-mixed and ready to use. Because it is applied cold and eliminates heating kettles, there is no fire hazard. Also, there are no obnoxious fumes such as accompany ordinary hot melted pitch compounds. Consequently, floor repairs and resealing can be done in sections without interrupting production.

Repair work is accomplished by (1) coating the floor base with Blockset (2) dipping blocks in Blockset (3) inserting blocks in floor (4) filling cracks with Blockset. For resealing, the adhesive is simply spread over the entire surface with a squeegee. It dries quickly and can be trucked over within an hour after application. It is also water resistant. By preventing moisture from penetrating cracks, it greatly lengthens floor life. Available in 5-gallon cans and in 30- and 55-gallon drums.

For details, use **Key # FM-1** on Inquiry Card on page 75.

SLIP-RESISTANT FLOOR FINISH

Legsure BX3-P, a resin-type floor polish, has been introduced by the Walter G. Legge Co. Inc. It is said the product requires no buffing, as it is self-polishing and dries to a high, hard lustre.

The manufacturer states that only occasional buffing is necessary to maintain a satisfactory finish. Long-lasting, it is also slip-resistant, and buffing tends to increase this safety factor.

For details, use **Key # FM-2** on Inquiry Card on page 75.

PRE-PAINTING FLOOR PREPARATION

Colonial Refining & Chemical Company has developed a preparation for painted floors intended to etch and clean floors properly in one application. According to the manufacturer, a large percentage of floor paint failures, where paint peels from concrete, are due either to improper cleaning or etching.

The new product, called Sure-Etch, is brushed over the area to be painted. An immediate bubbling process begins which quickly opens the floor pores. After rinsing and drying, the floor is ready for painting. The preparation will cover

FLOOR MAINTENANCE DEVELOPMENTS

approximately 200–250 square feet per gallon, as a general rule. It is recommended for dairies, creameries, packing plants, laundries, garages, etc., where floor conditions resist ordinary cleaning methods.

For details, use **Key # FM-3** on Inquiry Card on page 75.

TRANSFERABLE HEAD VACUUM

The Hild Floor Machine Company has announced the Model 655, a high powered outside bag industrial vacuum featuring two 1½ h.p. motors with a new propeller design. This machine is said to have the greatest CFM per ampere of power of any portable vacuum, yet it will not overload most power lines.

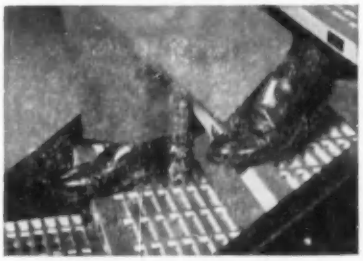
Model 655 fits any 55 gallon drum. The vacuum unit transfers

from drum to drum in seconds to speed heavy volume wet or dry cleaning. It can be used with one or two motors depending on the job, and each motor can be detached for use as a portable blower or "Strap-Bak-Vac."

For details, use **Key # FM-4** on Inquiry Card on page 75.

NON-SKID GRATINGS & TREADS

Relgrit abrasive surface, non-skid gratings and treads are said to offer permanent protection against slippery walkways, stairways, and platforms. Manufactured by the Reliance Steel Products Company, the gratings and treads incorporate a non-absorbent, hard, tough abrasive baked into V-shaped openings along their top edges. The abrasive is embedded about ⅛″ in depth



and extends above the bars. The abrasive surface has an adhesion to steel of 1,000 lbs. per sq. in., a tensile strength of 3,500 lbs. per sq. in., and a compressive strength of 19,000 lbs. per sq. in.

According to the manufacturer, this process retains the many advantages of open flooring, while providing safe, sure underfooting. The non-skid surface is said to be effective whether wet or dry, muddy or oil-soaked. It is resistant to most acids, alkalis, and chemicals. The durable gratings and treads comply with the safe materials classification of the National Safety Council.

For details, use **Key # FM-5** on Inquiry Card on page 75.

LIGHTWEIGHT FLOOR MACHINE

Multi-Clean Products, Inc., has introduced a new lightweight 12-inch

floor machine known as the Lite 12. Weighing approximately 35 lbs., it can be used for servicing areas up to 2,000 feet.

The machine is powered by a ½ hp industrial type, constant speed motor, which is operated by an industrial double pole, momentary contact switch. The switch lever is plastic coated for additional safety. The cord is gray, non-marking, 30-feet long of 16 gauge, 3-conductor type. The gear unit is lubricated for life and requires no maintenance.

Two heavy-duty, 3-inch wheels provide easy transportation. Floating or stationary handle positions give the operator a choice of position without disturbing the perfect balance of the machine.

For details, use **Key # FM-6** on Inquiry Card on page 75.

FLOOR MACHINE STAIRS RAMP

With a view to preventing the large number of accidents to custodians who attempt to transport heavy floor maintenance machines up and down stairs, the Safety Ramp Company has developed a strong, lightweight aluminum stairs ramp. Des-

ignated the "Safety Ramp" it is said to safely allow any standard-sized machine up to 21 inches in diameter to be pulled up or down the incline.

In use, the portable ramp may be temporarily laid over a flight of stairs, and later picked up to be used on the next staircase, or packed away for future use. The ramp, available in two 8 foot sections, contains a series of safety catches built into it at regular six inch intervals. According to the manufacturer, the catches will safely hold the machine at any point on the ramp, unaided by the custodian.

For details, use **Key # FM-7** on Inquiry Card on page 75.

FLOOR CLEANING PRESSURE SPRAYER

U. S. Sanitary Specialties Corp. has introduced its Number 732 Mobile Pressure Sprayer, a companion to their smaller hand sprayer unit. This new 15 gallon pressure sprayer cart has been specially designed for use with the company's Tileze XX cleaning agent and makes it possible to clean large areas with speed and economy.

The 732 sprayer is a compact unit of liquid and pressure tanks mounted on large cart wheels. Operating pressure of 60 pounds is maintained by pump lever. According to the manufacturer, tests have shown that the sprayer will operate for six minutes and cover 2,600 square feet of floor area on a single pumping. Tank capacity provides total coverage of 16,500 square feet with the company's Tileze XX. The sprayer is available on lease agreement or outright sale.

For details, use **Key # FM-8** on Inquiry Card on page 75.

GERMICIDAL FLOOR WAX

Trio Chemical Works, Inc., has introduced a germicidal wax to polish and sanitize most types of floors. Known as Amazon, the wax is said to be easy to apply and dries to a high, long-lasting lustre.

According to the manufacturer, the slip-resistant finish requires no buffing and is harmless to the skin, pets and people. In tests, the non-flammable product is claimed to have killed more than 99 percent of floor germs on contact. Effectiveness of the germicidal wax is said to be for the duration of the finish itself. Use of the finish is said not to darken or stain floors. Recommended for use on wood, asphalt and rubber tiles, linoleum and terrazzo floors.

For details, use **Key # FM-9** on Inquiry Card on page 75.

NON-FLAMMABLE MOP DRESSING

A new mop dressing, Super Hil-Sweep, has been announced by the Hillyard Chemical Co. Formulated for safe use on asphalt tile, it is effective on most types of floors. It is said to offer fast, thorough dust pick-up, greater coverage due to slow evaporation and to be non-flammable, non-slip, non-oily and non-reacting with wax or other floor finishes. According to the manufacturer, the dressing has no flash point; will not freeze; will not catch fire in use; will not cause spontaneous combustion in storage.

To use, the dressing is sprayed or sprinkled on the mop the night before. Because of extremely slow evaporation, the mop can be used to maintain large areas without re-treating. Sweeping is rapid, won't soften wax coat or cause "tacky" surface film. Super Hil-Sweep attracts dust, and holds it to the mop. However, it is not oily and will not load the mop. Shaking the mop will release the dust.

For details, use **Key # FM-10** on Inquiry Card on page 75.

VERSATILE VACUUM CLEANER

The Kent Co., Inc., has introduced a versatile vacuum cleaner known as the Quiet Triple Power Auto-Lift. Its "auto-lift" feature is designed to simplify removal of the metal tank when filled with water or other liquids. The attachment is foot-operated and places the tank in a position where it can be lifted out with minimum effort. The cleaner performs quietly, is highly mobile and can be used for wet or dry pickup.

The unit is equipped with a 1 H.P. by-pass motor and provides a volume of 180 cu. ft. of air per

minute. Its fill tank holds 1⅓ bushels of dirt or 10 gallons of water.

For details, use **Key # FM-11** on Inquiry Card on page 75.

ICE REMOVING COMPOUND

A new chloride-free ice and snow melting material in prismoid form, reputed to be harmless to pavements, metals and vegetation, has been announced by Speco, Inc. Known as Ice Rem-CF, it is said to be 99.99 percent chemically active and to contain neither calcium nor chlorides. Unlike ordinary ice and snow melting chemicals, CF does not produce a heat effect as part of its melting process. This feature makes it suitable for application on cement, concrete and asphalt. In addition, it is claimed that it will not corrode aluminum and other metals.

For details, use **Key # FM-12** on Inquiry Card on page 75.

NEW FLOOR FINISH

Award, a water emulsion, slip-resistant floor finish, has been developed by the Franklin Research Co. It is said to dry to a durable lustre and may be used in heavily-trafficked areas.

According to the manufacturer, scuff marks are kept to a minimum with the use of the finish, and occasional light buffing will remove any scuff marks present. The product, which is also non-flammable, is available in containers of 1-, 5-, 30-, and 50-gallons.

For details, use **Key # FM-13** on Inquiry Card on page 75.

Each of these 7 Edmont lines is job-fitted to Cut Costs

Neox No. 924 . . . 8 styles

NEW "FLEXIBLE NEOPRENE" COATED GLOVE: Edmont's popular reinforced neoprene (Neox) is now as flexible as plastic. Gives maximum protection for all-around use. Especially resistant to cutting, snagging, oil, acids and solvents. All gloves are of uniform quality, due to Edmont laboratory control of compound.

Grab-It No. 62W . . . 11 styles

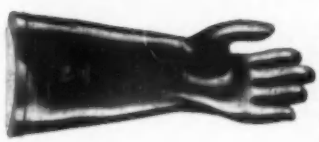
POSITIVE NON-SLIP GRIP, WET OR DRY, makes the Edmont Grab-It, with rough-textured natural rubber coating, the safest general handling glove on the market. Now made in curved-finger, wing-thumb pattern which gives a perfect fit.

Werx No. 151 . . . 2 styles

OUTWEARS CANVAS 4 TO 1, and costs far less than goatskin. Edmont's Werx glove is ideal for dry materials handling. Special plastic-impregnated material is very comfortable and has an excellent grip, is lint-free, moisture repellent, washable.

Monkey-Grip No. 31 . . . 13 styles

JOB-FITTED FOR ABRASIVE WORK: Edmont-compounded vinyl coating on Monkey Grip gloves insures uniform long wear. Frequently outwears leather. Exclusive pattern, with seamless palm, wing-thumb and curved, preflexed fingers, fits every part of the hand. Also available in triple-thick palm styles for extra protection and wear.



Redmont No. 938 . . . 6 styles

FOR HEAVY DUTY LIQUID-PROOF HANDLING: Redmont gloves have a 30% thicker coating of red Neox (reinforced neoprene) with a special cured-in, safety-grip finish. Recommended for maximum protection and long wear under severe conditions. Wing thumb, seamless palm, curved fingers.

Grappler No. 363 . . . 5 styles

HEAVY DUTY DUROX COATING, on Edmont Grappler gloves, has exceptional wet-grip characteristics. The exclusive reinforced plastic coating outwears ordinary plastic up to 50%. Wing-thumb, curved finger pattern provides maximum comfort.

Snorkel No. 404 . . . 3 styles

SUPER-FLEXIBLE LIQUID-PROOF GLOVE: Edmont Snorkel combines almost bare hand freedom with excellent protection. Abrasion-resistant plastic coating has special finish that gives outstanding wet or dry grip. Two-piece jersey lining has wing-thumb, curved pre-flexed fingers.

FREE TEST OFFER TO LISTED FIRMS: Tell us your operation, materials handled and temperature condition. We will recommend glove and coating that best fit job and supply samples for on-the-job testing.

EDMONT MANUFACTURING COMPANY

1256 Walnut Street, Coshocton, Ohio • In Canada write MSA, Toronto

(Use Key # Z-14 on Inquiry Card on page 75)

JET STREAM CLEANING UNIT

Oakite Products, Inc., has made available their Oakite Saniseptor, a portable, line-pressure injector which converts a hot water supply into a jet stream of cleaning solution. Hooked up to a hot water supply that is equipped with a hose and nozzle, and loaded with the recommended powdered detergent, the unit automatically mixes detergent and water at proper concentration as water passes through the hose. Rinsing is accomplished by shutting off the detergent supply and allowing the water to continue to flow.

The mobile unit consists of a steel detergent reservoir, mixing chamber, injector and valves. Weighing approximately 25 pounds, it holds 15 pounds of detergent.

For details, use **Key # FM-14** on Inquiry Card on page 75.

MAINTENANCE MACHINES

The new Tornado Heavy Duty Series 90 floor machine has been introduced as an all-purpose floor machine. It features non-marking wheels, dual switch controls to permit the operator to use either hand, and a soft rubber bumper to protect both machine and furniture from scratching. Series 90 comes in four different models, each with a motor that varies in H.P. from ¼ to ¾.

Tornado has also introduced its Series 80 vacuum cleaner. This versatile unit features a motor assembly that converts to six different cleaners in a matter of seconds. It can be used to pick up water, oil and chips from the floor, to clean out sumps, etc.

For details, use **Key # FM-15** on Inquiry Card on page 75.

NEW FLOOR SCRUBBER TANK

The complete line of floor scrubbing machines of Multi-Clean Products, Inc., has been equipped with a new "easy-fill" tank. By making the tank opening oval shape, the filling area has been increased from 27 to 38 square inches, according to the manufacturer. The design of the tank is such that even with the larger opening, the company reports, solution can't spill when the tank is tilted.

Other features of the new tank include its increased capacity of 3½ gallons compared to 3 gallons for former models. Tanks are constructed from heavy gauge steel with reinforced stainless steel bottoms. All-stainless steel models are also available.

For details, use **Key # FM-16** on Inquiry Card on page 75.

NON-WAX FLOOR COATING

A slip-resistant, non-wax floor coating for use on many types of floors, including linoleum, rubber, asphalt tile, vinyl, etc., has been introduced by Key Products, Inc. Easily applied, no polishing or rubbing is necessary, according to the manufacturer.

The product, known as Sayf, is non-flammable, water-resistant, will not spot white if properly applied. It is said not to have nor develop any chemical reaction harmful to flooring or flooring colors. One gallon of the product will cover approximately 2,000 sq. ft., depending upon the type of flooring being treated. Sayf is odor-free and quickly dries to a hard, lustrous finish.

For details, use **Key # FM-17** on Inquiry Card on page 75.

PLASTIC FLOOR BROOM

A new, multi-purpose floor broom has been introduced by the Harper Brush Works. The #77 Shopkeeper is said to sweep light dust as well as heavy dirt effectively. It is unaffected by grease and oil, is easily washed in gasoline or kerosene, and does not soften or absorb moisture when used in snow or water.

The plastic broom is available in 16-, 18-, 24- and 30-inch sizes with non-breakable handle connectors and handles. Recommended for warehouses, garages, industrial plants, offices, etc.

For details, use **Key # FM-18** on Inquiry Card on page 75.

CONCRETE FLOOR CLEANER

Grease Off, a fast-acting, emulsifiable solvent for removing oils, greases and tars, from concrete floors and pavements, has been announced by the Colonial Alloys Company. Easy to apply, it may be sprayed, wiped or brushed on the surface to be cleaned. Allowed to stand for about five minutes, it is then water-washed until its milky color disappears, and with it oil, grease and tar stains, according to the manufacturer.

The product is not considered toxic (500 p.p.m.) and is also said to be effective for the removal of greases, oils, drawing and polishing compounds, tripoli and other fatty matter from metals, woods and vitreous enameled and plated surfaces. Grease Off is available in 1-, 5-, 15-, 30- and 55-gallon containers. It is recommended for use in garages, oil refineries, fat rendering plants, industrial plants, etc.

For details, use **Key # FM-19** on Inquiry Card on page 75.

TWO DETERGENT CLEANERS

The G. H. Packwood Mfg. Co. has introduced two liquid cleaners, one a general purpose cleaner known as Pax Formula TL-13. This is a liquid detergent developed specifically for safe use on aluminum equipment and aluminum-painted surfaces. It is especially useful for removing heavy oils and greases, and can be used on floors, woodwork, walls, etc.

Pax Regular cleaner is a liquid detergent said to clean all types of floors without scrubbing or rinsing. According to the manufacturer, it is effective in hard, soft, hot or cold water, and can be safely used at full strength for stubborn soils.

For details, use **Key # FM-20** on Inquiry Card on page 75.

Nose need
DUST PROOFING
?
YOU NEED . . .
DUPOR No. 1
The miniature nose mask that is as handy as a pair of glasses. So light, less than 1 ounce. So convenient it can be worn while smoking, eating, talking. Amazing 9 sq. in. filter. Vest pocket size. Can be carried, ready for use instantly. Write for details! Send $1.20 today for sample!
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SOUTH BEND 14, INDIANA
"Respirators for Industry since 1894"

(Use Key # Z-15 on Inquiry Card on page 75)

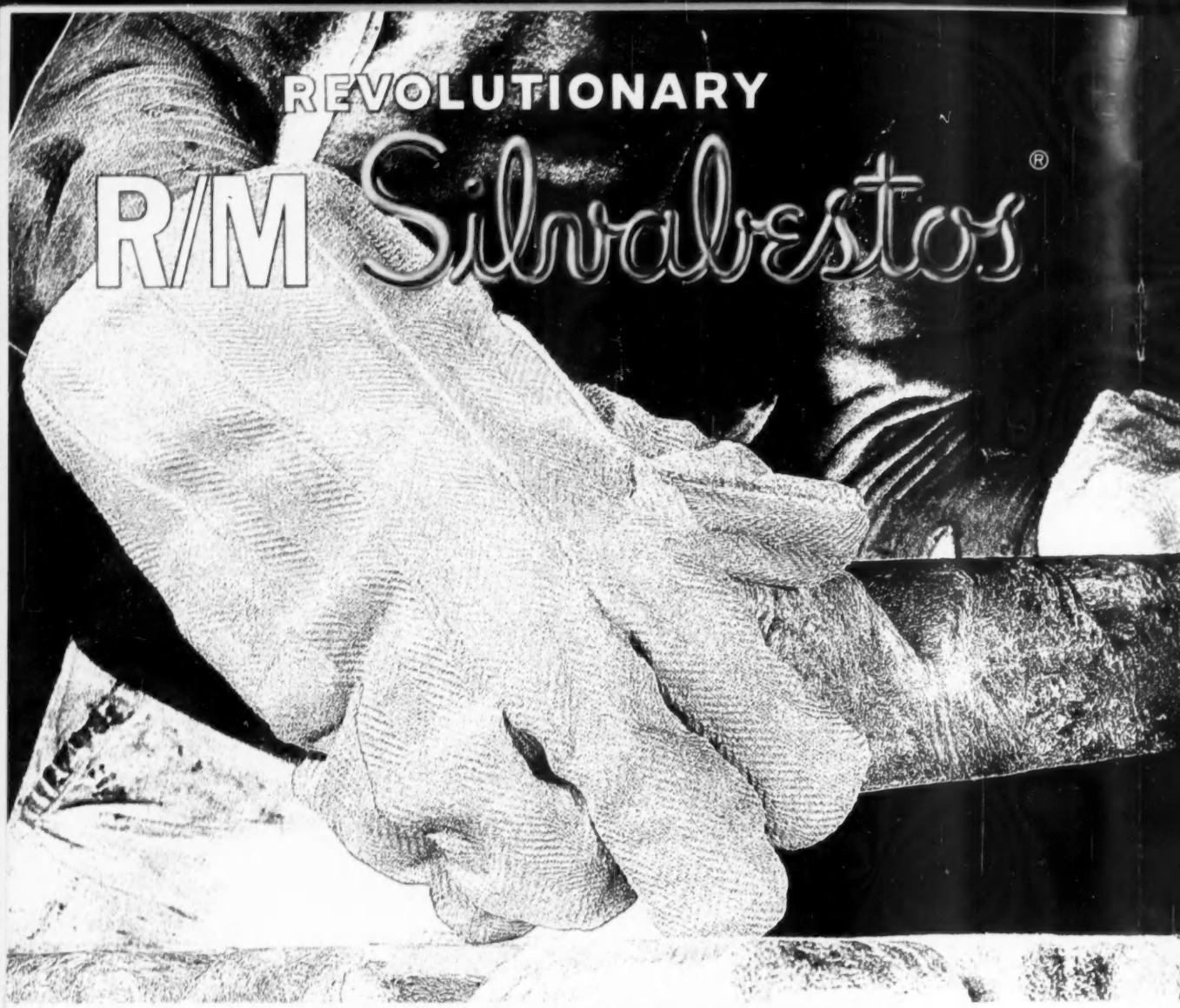
DUST MOP TREATMENT

A non-oil treatment for dust mops that absorbs dust, is water-soluble and non-flammable has been developed by the Davis Mfg. Co., Inc. Known as 906 it is said to eliminate flying dust by suspending particles until the mop is washed. Floors, therefore, are mopped cleaner.

The treatment is used dry and leaves no residue. The company states that ease and thoroughness of cleaning afforded by the use of 906 also results in longer mop life.

For details, use **Key # FM-21** on Inquiry Card on page 75.

(Continued on page 42)



Handling hot aluminum ingots with gloves made of R/M Silvabestos.

NEW R/M Silvabestos® COATED CLOTHS

Special R/M coating process adds amazing strength to asbestos cloth—means longer-wearing, lighter, more comfortable safety clothing

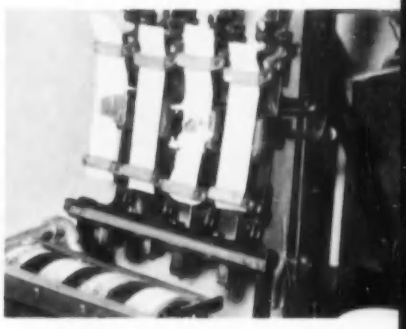
The extra wear and heat resistance built into R/M's new Silvabestos cloths are vitally important to all safety directors in plants where contact with hot surfaces is a major hazard. Not only can lighter, more flexible clothing be worn, but tests show that Silvabestos will give increased protection at lower cost.

Silvabestos derives its long service from an aluminum-resin coating applied by an original R/M process. It should not be used in contact with open flame. Silvabestos has relatively low reflectivity. Abradoflex tests demonstrate that it increases the wear factor of uncoated A.S.T.M. Underwriters' Grade asbestos cloths up to 297%. Here's a summary of various test findings:

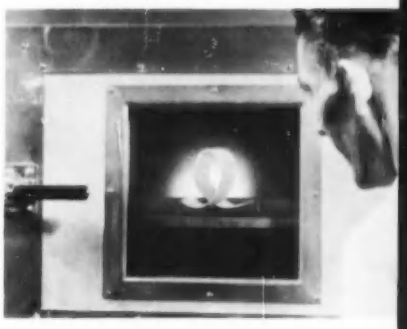
- 27 to 297% wear improvement factor in Abradoflex ratings
- 39 to 249% increase in wear resistance, according to Wyzenbeck wear tester
- 27 to 56% increase in retained tensile after 1 hour at 450° F.
- No more than 0.6% loss in tensile after 3-hour flex test

When you specify safety clothing for your plant, be sure it is made of genuine R/M Silvabestos. The Silvabestos label is your assurance of better protection and longer wear.

The Abradoflex Tester developed by the laboratory of the Asbestos Textile Institute simultaneously applies abrasion, flexing and creasing actions to cloths under test to simulate normal wear conditions. Resulting degradation is evaluated in terms of loss in tensile strength, and index thus determined indicates the relative wearability of the fabric.



Wyzenbeck Wear Tester. This device measures the wear resistance of fabrics by subjecting them to the action of an abrasive-covered oscillating drum. The second and fourth strips from the left are Silvabestos Cloth; the others are uncoated cloth.



Muffle Furnace in which the samples of fabric were heated for 1 hour at 450° F. A comparison was then made between their retained tensile strength and their original tensile strength to determine the amount of heat degradation.

Note: Complete test data available on request

WEAR UP TO 3 TIMES LONGER!

Raybestos-Manhattan does not manufacture safety clothing of any kind. The following leading manufacturers are prepared to furnish asbestos safety garments made from Silvabestos cloth:—

Allied Glove Corporation
321 E. Chicago Ave.
Milwaukee 2, Wis.

Asbestos Products Company
3865 West 150th St.
Cleveland 11, Ohio

Beatty Safety Equipment Co.
5416 North 56th St.
Milwaukee 16, Wis.

Holcomb Safety Garment Co.
128 North Jefferson St.
Chicago 6, Ill.

Mid-West Glove Co., Inc.
1744 North Damen Ave.
Chicago 47, Ill.

Mine Safety Appliance Company
201 North Braddock Ave.
Pittsburgh 8, Pa.

Pulmosan Safety Equip. Corp.
644 Pacific St.
Brooklyn 17, N.Y.

Pulmosan Safety Equip. Corp.
1007 Washington Ave.
St. Louis 1, Mo.

Quaker Safety Products & Mfg. Co.
Main & Juniper Sts.
Quakertown, Pa.

Racine Glove Company, Inc.
Rio, Wis.

Safety Clothing & Equip. Co.
1990 East 69th St.
Cleveland 3, Ohio

Star Glove & Asbestos Co.
2825 Whittier Blvd.
Los Angeles 23, Calif.

Syracuse-Elbridge Co., Inc.
1108 Spring St.
Syracuse 8, N.Y.

RM

RAYBESTOS-MANHATTAN, INC.

ASBESTOS TEXTILE DIVISION, MANHEIM, PA.

FACTORIES: No. Charleston, S.C. • Manheim, Pa. • Bridgeport, Conn. • Passaic, N.J. • Neenah, Wis. • Crawfordsville, Ind. • Peterborough, Ontario, Canada

RAYBESTOS-MANHATTAN, INC., Asbestos Textiles • Laundry Pads and Covers • Engineered Plastics • Mechanical Packings • Sintered Metal Products Industrial Rubber • Rubber Covered Equipment • Abrasive and Diamond Wheels • Brake Linings • Brake Blocks • Clutch Facings • Industrial Adhesives Bowling Balls

FLOOR CLEANING DETERGENT

A liquid floor cleaning detergent, said to retain its solubility and effectiveness in any water condition including those strongly alkaline, has been introduced by the Industrial Soap Department of Armour & Company. The detergent is fast wetting and results in profuse, stable, free-rinsing suds.

Known as Regal Liquid, it has a pH of approximately 6.8 and is mildly scented. For cleaning floors and walls of all types, 1 oz. per gallon of water is recommended. The detergent may also be used for cleaning rugs, upholstery, and many different fabrics.

For details, use **Key # FM-22** on Inquiry Card on page 75.

COMPRESSED AIR VACUUM

The Vibro-Pneumatic Cleaner Co. has made available an industrial vacuum cleaner powered by compressed air. A switch on the handle enables the operator to use pulsating air valves in the head of the unit. The expulsive valve causes jets of high pressure air to squirt out of an outlet in the head casting. After the dirt has been dislodged, the operator switches to a high frequency (7800 cycles per minute) suction which draws the dirt into the mouth of the floor nozzle.

The cleaner has no electrical components and, consequently, no fire hazard from sparks. Useful in many applications, it is particularly adapted to where there is exposure to explosive dusts (chemical manufacturing concerns, mining and power plants, grain industries, flour mills, etc.) Model #1004 is illustrated.

For details, use **Key # FM-23** on Inquiry Card on page 75.

A SAFETY IDEA

Safety Maintenance SALUTES

Safety in Handling Bundled Lumber

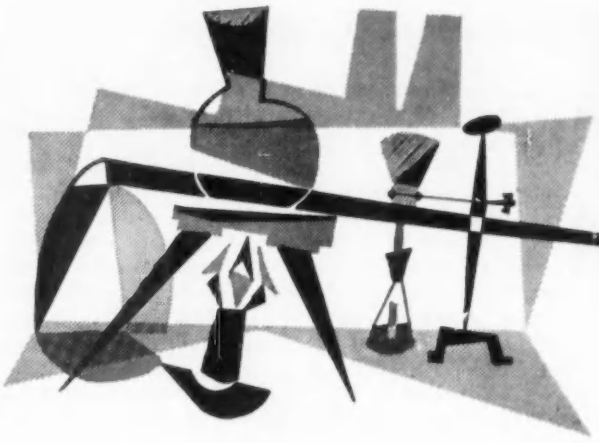
Through the use of a relatively new type of sling, the Weyerhauser Timber Company has been able to reduce damage to almost nothing in handling bundled lumber. At the same time, this sling greatly increases safety on loading docks.

As shown in the picture, the sling, because of its woven wire construction, provides a broad, flat bearing surface that fits snugly around the corners of the load during the lift. This snug fit is provided by the transverse loop construction of the sling that permits it to hinge across its width rather than along its length, thus eliminating the cutting action at the corner of the load.

The particular sling shown here is 4 inches wide by 14 feet long. The load weighs approximately 3,500 pounds. The basket hitch illustrated provides maximum strength. The same sling may be used in a choke hitch for maximum grip by passing one handle through the other and attaching it to the crane hook.

Picture by courtesy of Cambridge Wire Cloth Co.

< For further details on the product advertised on the preceding page, use Key # Z-16 on card on page 75.



industrial hygiene

Edited in cooperation with
OCCUPATIONAL HEALTH INSTITUTE

Educational affiliate of
INDUSTRIAL MEDICAL ASSOCIATION

Atomic Energy Medical Research

The Atomic Energy Commission has contracted for construction of the United States' first Atomic Energy Commission Medical Research Center. The Center, which forms part of the Brookhaven National Laboratory, will contain a nuclear reactor specifically designed for medical research and therapy. Scheduled for completion in 1957, the Center will include research laboratories, a 48-bed research hospital, and an industrial medicine branch for Brookhaven personnel.

Medical Examinations

A recent survey shows that the average physician strongly endorses mass education programs of voluntary health groups, and that he feels such groups have been influential in getting people to seek medical care in earlier stages of illness. Reported in the *JAMA* March 31, 1956, the survey is one of a series conducted by the National Opinion Research Center, Princeton, N. J., under a grant from the Health Information Foundation. Interviews with the general public showed that 80 percent of adults endorse the principle of a general physical check-up every year, "even if a person is feeling all right," but only three out of 10 even claim to get such check-ups; that monthly breast self-examination for cancer is approved by 79% of the doctors, while semi-annual pelvic examinations for all women over 35 are approved by 71%; and that semi-annual chest x-rays for all men over 45 are approved by 42%.

Industrial Health Foundation

A Foundation to promote efficiency and to expand benefits of industrial health plans has been created by the International Association of Machinists and U. S. Industries, Inc., a national manufacturing company employing about 6000 persons in five states, Puerto Rico, and the Philippines. The purpose of the Foundation is to develop plans for the broadest possible range of health and welfare benefits, including preventive medicine, psychiatric care, ophthalmic and dental treatment for workers and their families at the lowest possible cost and in the most effective and economical way. Co-chairman of the foundation's Board of Directors are A. J. Hayes, President of the Machinists' Union, and John I. Snyder, President of U. S. Industries. The Foundation on Collectively Bargained Health and Welfare Plans hopes to make its findings available to industry and labor organizations as a public service.

—*American Journal of Public Health*, September 1956.

Toxic Materials Guides

The Hygienic Guides Committee of the American Industrial Hygiene Association has developed and published 25 guides to the toxicity of common industrial materials. Each guide includes the following information: (1) maximum allowable concentration for both short and long term exposures; (2) significant chemical and physical properties; (3) major uses; (4) evaluation of exposure; (5) engineering control procedures; (6) medical control procedures; and (7) references to the literature. Five of the guides, which are intended to bring together all pertinent facts necessary to hazard evaluation, are published in each issue of the "*AIHA Quarterly.*" They are also available in loose leaf form at 25 cents each, from the AIHA office, 14125 Prevost, Detroit, Michigan.

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FOR EXTRA SAFETY

THERMAL SAFETY SWITCH Protects Motor!

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NEW THERMAL SAFETY SWITCH! Important safety feature offered for the first time on any explosion proof vacuum . . . gives you complete protection against circuit overload and motor burnout.

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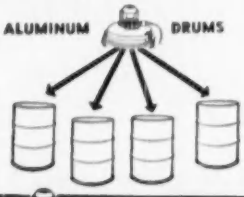
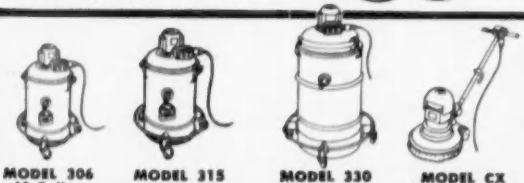
NEW 30 AND 55 GALLON MODELS! The addition of 30 and 55 gallon vacuums gives Hild the most complete line of portable explosion proof vacuums in the industry. These new models are designed for large volume or bulk cleaning . . . they eliminate constant emptying necessary with small tanks.

NEW DRAIN VALVE! Hilds new 30 and 55 gallon explosion proof drums have a handy dump valve for rapid draining of liquid material . . . no lifting necessary.

NEW TRANSFERABLE HEAD! Vacuum unit with adapter ring can be used on Hild's 10, 15, 30, and 55 gallon listed drums. You can use the right size and number of drums for every cleaning job . . . fill as many 55 gallon drums as the job requires. Excellent for transfering liquid or storing waste for pickup.

ALUMINUM DRUMS





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Inter-American Conferences

The First Inter-American Conference on Industrial Medicine and Toxicology, sponsored by the University of Miami School of Medicine and the University of Havana School of Medicine, was held in September at the University of Miami, Coral Gables, Florida. Physicians from Chile, Colombia, Cuba, Mexico, Peru, Puerto Rico, Spain and Venezuela were in attendance at the sessions. Subjects presented at the conference included: "Medical Policies of Some Petroleum Companies in Colombia"; "The Growth of Occupational Health in Latin America"; "Medicine and Industry"; "Improvement of the Health Conditions of the Workers"; "Neurological Problems in Occupational Medicine and Toxicology"; "Environmental and Occupational Lung Cancer"; "The Mental Health and Welfare of the Worker"; "Chronic Intoxication by Hydrocarbides (A Petroleum By-Product): Chronic Oil Disease"; "Occupational Dermatitis"; "Prevention and Treatment of Intestinal Parasitism in the Oil Worker"; "Occupation and Heart Disease"; "How to Avoid Backaches"; and "Prevention of Silicosis."

The Second Conference sponsored by the Universities of Miami and Havana will be held at the University of Havana School of Medicine, Havana, Cuba, in 1958.

The Turtle Club

The Turtle Club is an organization whose membership is composed of those whose lives have been saved by wearing a "hard hat" safety head protection at the time of an accident. International sponsor of the organization is E. W. Bullard, President of the E. D. Bullard Company, San Francisco. Current membership numbers almost 1400 persons in the U. S., South and Central America, Europe and Canada.

Food Planning Service

Farley Manning Associates, as public relations agency for the Paper Cup and Container Institute, Inc., is now offering a food facilities planning service for the heads of industrial plants, schools, hospitals, and churches and architects, builders and kitchen designers in these fields. Its purpose is to enable those responsible for large-scale food service to take full advantage of the economies in the building and operating of kitchens now offered by modern paper service products.

Director of the new service is Owen Webber, an internationally recognized authority in the field. The new kitchens at Dartmouth College, the University of Rochester and New York Hospital are among the most recent Webber designs in a long list of fine institutional and commercial installations. He has also acted as consultant on Navy ship and submarine facilities, created designs for dining cars on many of this country's de luxe railroad trains and lectured at the University of Chicago and Teachers' College, Columbia University for a total of more than 25 years.

management wants to know:

WHAT'S ALL THE NOISE ABOUT NOISE?

by JOHN STRONG
Engineering Department
Allied Witan Company
Cleveland, Ohio

Noise control in factories and offices is one of industry's most talked about problems today. There's no denying that noise, as such, is undesirable both physically and emotionally. But one might wonder why the noise that has always been synonymous with factories should be such an issue today . . . why wasn't greater emphasis placed upon proper noise control years ago?

Is the whole thing a blown-up issue of the "indulgent twentieth century"? Are the people in the noise control fields making the big play for more and better noise abatement? These are some of the questions that management is asking, because in all that has been said and written about noise, there has been a lack of analysis as to how all this will affect management. They're asking many other questions, too:

Is noise control going to increase worker efficiency, or is it going to put the worker to sleep?

Is noise really physiologically and neurologically harmful?

Is the cost of adequate noise control worth the increased efficiency that might result?

What good will soundproofing do when we'll still have the noise source?

All of these questions can be answered; actually, some of them have been in one form or another. But these are all questions that management, the holder of the purse-strings, is asking; therefore, we shall try to analyze the noise problem from their point of view.

First, we should realize that noise is not a new problem at all. The knowledge that noise was undesirable and therefore emotionally harmful, existed thousands of years ago in ancient Greece. The assumption that "noise in industry is here to stay and there isn't anything science can do to eliminate it" seems to have been the general belief until the late nineteenth century. This frame of mind has done more to inhibit progress in the fight to control noise than anything else. Perhaps if someone had made an issue . . .

For purposes of clarification, let's determine which forces created the current interest in adequate noise control. The various trade and labor unions have had great interest in the noisy conditions in certain areas of American industry, and they have been encouraged

by the great importance the liability companies have placed on noise abatement.

Each year thousands of dollars are awarded to litigious applicants who have suffered partial or total hearing loss as a result of the noisy conditions in their work. The insurance companies are therefore interested in a program of preventive medicine. So are state governments. Recognition of noise as a major factor in worker compensation suits has prompted some states to pass certain safety laws governing the noise level in factories.

Incidentally, these are not so-called monopolistic states, either—where compensations are paid out of a state fund and independent insurance companies are not allowed to write compensation for workers. The mutual agreement between labor, insurance companies, and state legislatures concerning the importance of adequate noise control speaks well for the current interest.

The insurance companies have necessarily devised methods for testing new employees to determine their hearing ability at the outset of a job venture. They are also testing noise levels within factories to determine the extent of risk involved.

The Crux of the Issue

The premise on which is based a great deal of management's reluctance is: since noise source will always exist, what good will soundproofing do . . . we'll still have the original noise.

Acoustical engineers long ago showed that reverberations, which result when sound waves are permitted to bounce off of stationary structures, create a noise build-up. Sound waves, like ripples on water, expand as they travel out into the atmosphere. As they expand, they weaken and slowly begin to dissipate. This dissipation is called "intensity decay." When they strike a stationary structure they bounce directly back and, in their return flight, encounter the primary waves emitting from the source. As these reverberations overlap you have a condition of sustained sound wave chaos. The greater the intensity of the sound waves, the more multitudinous the echo. The theory of sound-absorbing material is that, as the sound waves strike it, a certain percentage of the waves are absorbed, thus reducing the intensity.

There is, of course, much more to the theory of sound absorption than given here, but we are more interested, here, in analyzing the emotional causes for a reluctance toward sound control. There are methods of baffling, strategic placement of noise sources, heat and humidity control, etc., which all go to make more perfect sound cancellation. Any acoustical engineer can report the latest and best methods available. It should suffice to say that noise can be reduced to varying degrees. Science actually is doing something to eliminate noise. The important point, here, is that only by employing the advancements made thus far can we make a concrete step forward to the day when ultimate noise cancellation will be a reality. The interest must necessarily begin now—without it we're admitting to the same concept that "noise is here to stay."

Another reason why progress in adequate noise control has developed at such a snail's pace is that, until relatively recently, no connection was made between noise and the harmful physical effects it produces.

In an attempt to determine the extent to which people are affected by loud noises, Dr. F. Kennedy undertook a series of investigations at Bellevue Hospital in New York City. In one experiment, he placed a small drum containing a partial vacuum over the soft area of the head of his subjects. Vibrations from the drum were communicated to a sensitive needle acting on a carbon-blackened paper. After recording normal intercranial pulsations, the subjects were exposed to various noises and their pulsations were recorded and then compared to the normal. In a simpler experiment in which paper bags were inflated and then exploded behind the subject's head, a notable rise in the intercranial pressure was recorded immediately. It showed that pressure had been increased to four times the normal pressure and that it remained so for seven seconds . . . for several seconds afterwards, the pressure was irregular. In addition, it was found that under noise exposure, irregularities occurred in heart rhythm, pulse rate, and blood pressure.

There are many reports on experiments such as these. It should suffice to say that there are definite physiological and neurological changes occurring under exposure to noise; and apparently the human body, by virtue of its want for normal metabolism, never fully acclimates to the adverse effects of noise.

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City _____ Zone ____ State _____
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(Use Key # Z-13 on Inquiry Card on page 75)

Other kinds of experimentation have been made to prove that an excessively noisy area impairs efficiency.

Noise control is increasingly important. In fact, it's a three-fold project . . . along with improving worker-relations and increasing efficiency, it will save management some money in lower insurance premium costs or litigation on cases of hearing loss.

What Will Noise Control Be Like in the Future?

When we speak of ultimate noise cancellation we mean stopping noise at its very source. This is what the future must certainly hold for us. The principle of canceling noise at its source is a relatively simple one, but its actual accomplishment is rather complex. Experimentation is going on now to iron out the bugs.

However, the principle has been successfully applied to some areas of noise cancellation and the results are encouraging—the pneumatic muffler, for example. In the case of pneumatic equipment that operates on a cycle principle, the machine has to "dump the air" at the completion of every cycle. This exhausting of air causes an extremely loud noise (depending on the amount of air pressure used). In many cases the noise is comparable to that of a rifle shot. The principle of the pneumatic muffler is to take the exhaust air and break it into three separate channels and redirect them, within the muffler, so that they collide. This collision causes them to expel most of their energy on each other. With their intensity reduced, the separate channels merge again and come out through the full radius of the muffler in a mere whisper. In this instance, by reducing the intensity behind the waves, you reduce their ability to travel.

In the General Electric Laboratories in Pittsfield, Mass., they have applied roughly the same principle to the problem of canceling sound waves in the air. They have created what they call a "beam of silence." By directing sound waves out of phase (where the crests of one sound wave coincide with the valleys of another) they have been able to cancel out both noises completely. GE admits that this is still experimental work, however. While they are able to stop noise along a defined lane, the noise builds up in other areas of the room. But it proves that noise cancellation through directed sound waves is theoretically possible.

Perhaps some day, when they have ironed out the difficulties involved with viscosity factors, fluctuating phase relationships, heat content, etc., they will have the problem of ultimate noise cancellation solved.

Maybe some day a radar-type unit will be developed that will stay in constant "tune" with various noise sources as they develop, modulating frequency and intensity of the various sounds as they are produced.

But in the meantime, the theory of noise control and the decided benefits that can be gained from it are the things that management should consider. Sound control, noise cancellation, sound absorption—call it what you will—it is the coming thing in American industry.

Ladders and Scaffolds by Patent Scaffolding Co.

"Gold Medal"® LADDERS

Safety Platform Ladder illustrated. Platform heights 3′ to 18′. *UL Approved.* Also wood and magnesium ladders, single types 8′ to 24′, extension ladders 16′ to 32′ and all types of step ladders to 20′.

"Gold Medal"® Junior SWINGING SCAFFOLDS

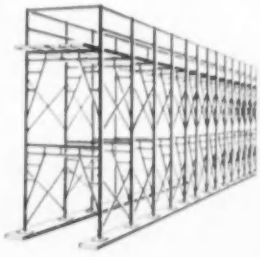
Extra-safe for light maintenance and painting outside of buildings, tanks. Steel wire rope replaces rope tackle for greater safety; winds on drums attached to scaffold. Three-way lock prevents slipping. *UL Approved.*

ALUMINUM "Fold-A-Way" SCAFFOLDING

"Packaged" units open like a book for fast set-up. Require minimum storage when folded. Rollers allow easy movement when erected. Base area 4½′ x 6′. One, two or three sections high. *UL Approved.*

ALUMINUM LADDER SCAFFOLDS

2′ or 4′6″ wide units are built up from ladder frames. Available with 6′, 8′ or 10′ platform. Disassembles for storage. *UL Approved.*



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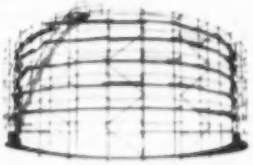

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(Use Key # Z-19 on Inquiry Card on page 75)

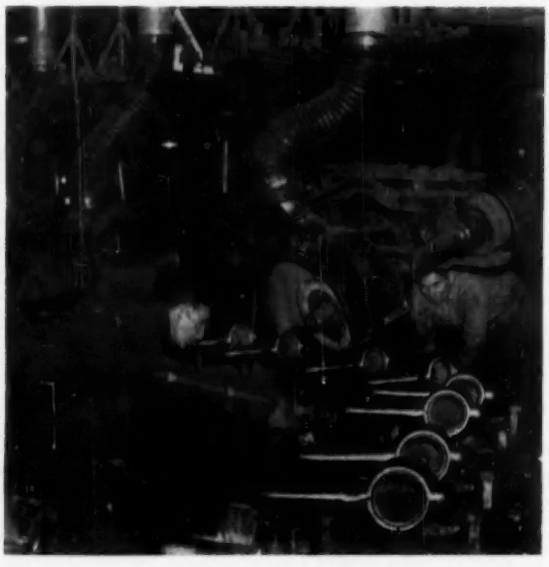
Flexible Tubing Hygiene

Safety engineers, and others responsible for maintenance of safety standards in industrial plants, have been finding a valuable assistant in flexible spiral ducting. Particularly under conditions where removal of lethal or irritating fumes and abrasive particles is essential to the well-being of workers, the flexibility, portability, lightweight, and easy handling of this type of ducting have recommended its use, since it is notably free from the problems involved when comparable installations or rigid ducting are made.

During the past several months, several installations of flexible ducting for safety maintenance have been made, each of them with ideas that can readily be put to effective use by thousands of industrial firms. The accompanying pictures, here and on the next pages, tell their own story.

These examples of the use of flexible spiral ducting to provide greater plant safety could be multiplied indefinitely, but those we have reviewed here illustrate basic uses which any industrial plant can readily adapt to its own requirements. This flexible ducting is available with a variety of coatings, depending on the type of fumes or particles it must carry. All types of this ducting have the features of great flexibility and retractability to a fraction of extended length; all types are light, easily handled, and readily carried from place to place. Lengths can be instantly coupled by simply inserting the end of one into the end of another; pressure of the reinforcing spring helix in each will hold the two firmly together.

A source for further information about flexible spiral ducting can be obtained on inquiry to the Editor.



Chemical Laboratory

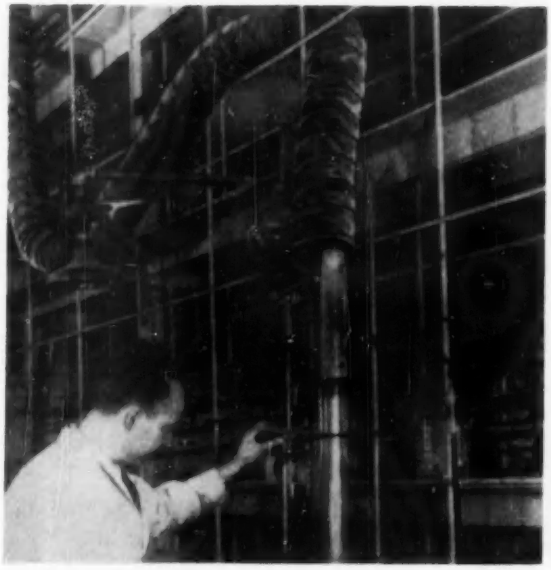
(Right)

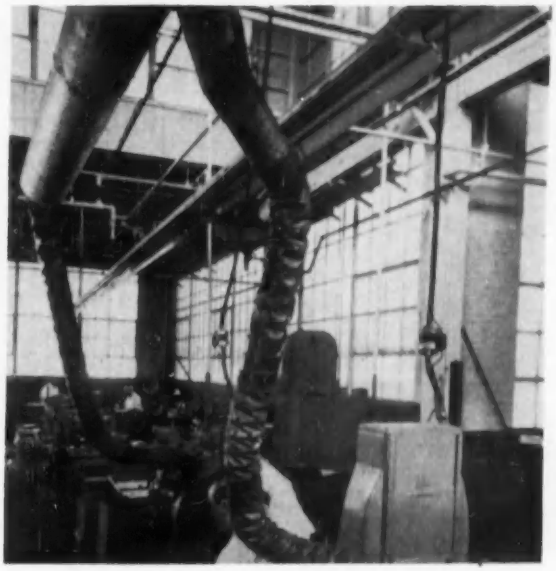
Fumes are an ever-present hazard in chemical laboratories, but in this one, at the "Mini-Plant" of Wyandotte Chemicals Corporation, flexible spiral ducting is used to carry away fumes from any experiment that produces them. The lightweight ducting can easily be positioned over large test tubes, retorts, and other chemical vessels, and fumes are readily drawn off through it. When experiments are completed, it can be retracted to a small fraction of its extended length, and compactly stored until it is needed again. Because it is light in weight, it will not damage even delicate chemical vessels when it comes into contact with them. A variety of coatings can be provided, so that the ducting will be resistant to even highly corrosive fumes.

Polishing Machines

(Left)

The movable heads of these automatic buffing and polishing machines in the East Boston plant of A. S. Campbell Co. had always given a good deal of trouble. The heads follow the contours of the work, and the dust hoods and ducting must follow the movement of the head. When rigid metal ducting exhaust systems were tried, trouble followed. In the first place, complicated ball-and-socket joints were required to allow for movement, and this was costly, noisy, and prone to develop leaks after continued use. Metallic flexible ducting permitted no retraction whatever, and tended, because of its weight, to press down on the polishing heads. The problem was solved with spiral flexible ducting of wire-reinforced, neoprene-coated fabric, which is light in weight, able to flex readily in all directions and to retract instantly with the movements of the polishing head.





Temporary Grinders

(Above)

Solves Problems

In the Union, New Jersey, plant of The Elastic Stop Nut Corporation of America, flexible spiral ducting is used to exhaust abrasive particles from the grinders in the tool room. The use of flexible ducting solved a special problem here, since the machines in this tool room are subject to frequent shifts in location. Each grinder is equipped with an adequate length of flexible spiral ducting which is connected to a permanent main exhaust duct. When it is necessary to shift the position of the grinders, this can be done without disconnecting the flexible ducting. The neoprene-coated ducting is designed for long service and is toughly resistant to the abrasive particles it exhausts.

(More pictures on following page)

Tank Purging

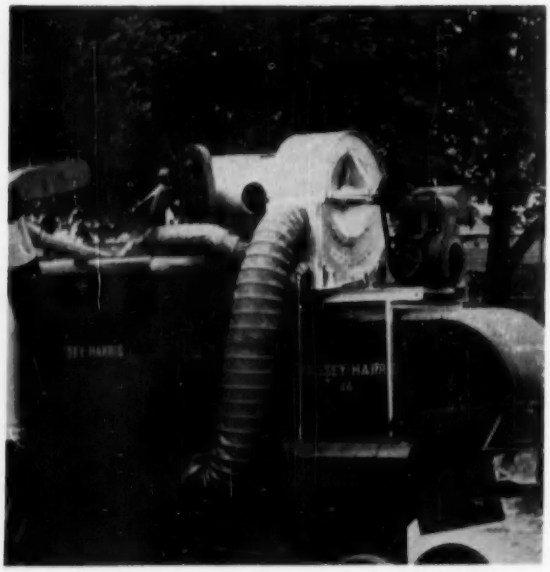
(Right)

Carbon dioxide fumes used to make a real problem for the Metz Brewing Company of Omaha. After the large bottling tanks are emptied, an overpowering volume of carbon dioxide remains in the tanks, and must be removed completely before it is safe for workers to enter the tanks to clean them thoroughly. Before flexible spiral ducting was put to use, a full day or more was lost before these carbon dioxide fumes were exhausted. Now, Metz uses 8″ diameter flexible ducting, led right into the tank, and connected with a suction pump. These large tanks are completely cleared of dangerous fumes in less than an hour, making it safe for the maintenance men to enter. The ducting is easily moved from one tank to another, and when fume clearing is completed, the 25-foot length can be retracted to little more than 3 feet for storage.

Paint & Welding Fumes

(Right)

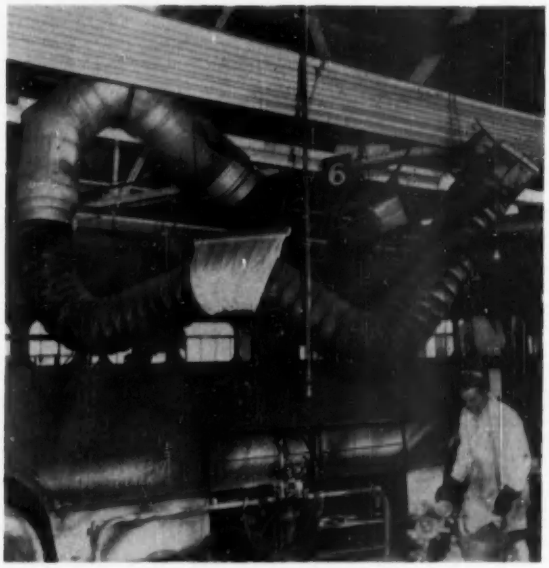
At the passenger bus plant of the Twin Coach Company, in Kent, Ohio, both welding and paint fumes offer a hazard to workers. Removal of these fumes is accomplished by an installation of flexible spiral ducting. Adequate lengths of tubing are installed at the working area for each passenger bus, so that the mouth of the tubing can easily be moved to any point by the painter or welder. When the work is completed, the tubing is quickly and easily lifted out of the way by a sling. Here again, a system of rigid ducting would have been much more expensive because of the complicated ball and socket arrangements that would be required to provide movement.



Welding Fumes

(Left)

Welding fumes are a serious problem in the Todd Shipyards at Hoboken, New Jersey—or they were, until flexible spiral ducting came along to offer a thoroughly practical way of carrying off dangerous fumes during the welding process. Metal ducting was not at all successfully applicable to this situation, since the welder is almost constantly in movement from one point to another in the ship. Flexible spiral ducting proved to be more appropriate here, since its weight is only about one-fifth of the same length in metallic ducting. It is interesting to note that the 25-foot length of spiral flexible ducting used for this welding fume removal at Todd can be retracted to only 38 inches in height for compact storage when the welding job is completed, and can easily be handled by the one man.



Combine Dryer

(Left)

Many a manufacturer is finding this flexible spiral ducting a real advantage in providing safety in the products he manufactures, as well as in his own plant. The Bishop Engineering Company, of Dallas, manufactures a combine dryer which can be installed on any farm combine. Using a combine equipped with this dryer, a farmer can harvest grains regardless of their humidity or surface moisture and does not need to worry about mildew or spontaneous combustion in the bales. In this unique installation, flexible spiral ducting is used to carry hot air from the heater and blower on the top of the combine to the header, thresher and several drying units, drying the grain thoroughly as it is harvested and baled. This dryer-combine carries 35 feet of flexible ducting—but the weight of this totals only 29 pounds—a very small fraction of equivalent lengths of any type of metallic ducting. The flexibility of this ducting is an important factor in this installation, since the ducting must bend to fit many awkwardly placed outlets and connections.

Achievements and Awards

Dana Corporation's Fort Wayne, Ind., division recently received a special Dana award in recognition of its completion of 1¼-million man-hours without a lost-time accident.

William Collyear, plant safety director, said this outstanding record results from constant salesmanship on the part of management to foremen, and from the foremen to all plant employees. Not only the safety department and its safety committees, but every individual in the plant looks constantly for hazards because they have been thoroughly "sold" on the importance of doing so, he explained.

Then, when a hazard is discovered, it is closely analyzed before protective devices are issued. This is done because some items considered to be safety equipment can, when used under improper circumstances, actually be safety hazards. Therefore it's an invariable rule at the Dana Fort Wayne division that the safety department must specifically authorize the issuance of all protective devices, which is done only after the affected jobs are closely scrutinized.

"Many times safety problems are solved by simply changing employee's work habits," Collyear pointed out. "Unsafe motions performed day after day frequently escape the notice of the person doing a given job, but can be instantly spotted by someone else who is perhaps more safety conscious."

A safety shoe store has been installed within the Fort Wayne plant where employees can conveniently purchase a wide selection of safe footwear. Safety glasses and goggles are also made readily available.

Various safety equipment items used at Dana's Ft. Wayne plant.

Striking tool heads that spall and mushroom are an ever-present hazard to the safety of workers. Flying chips from tool failure can cause injury to the arms, face and body. Valuable production time is lost as a result of these unnecessary accidents.

You can carry your plant safety program one step further with the use of TAMCO SAF-T HEAD striking tools. TAMCO SAF-T HEADS resist spalling and mushrooming when struck, require less frequent tool dressing, and pay for themselves many times over through long, dependable service life.

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(Use Key # Z-20 on Inquiry Card on page 75)

ble. Periodic meetings conducted with foremen, and standard safety posters also enter into the plant's continuing programs.

• • •

William F. Brown, safety director of Consolidated Edison Company has received the Arthur Williams Memorial Award from the American Musuem of Safety at that organization's Harriman Memorial and Arthur Williams Memorial Award dinner in New York City. Mr. Brown received the award in recognition of "inspiring leadership in local, state and national safety achievement." He has been safety director of Consolidated Edison since 1944, and has been active in the field of industrial safety for thirty-seven years.

In his work in behalf of the advancement of industrial safety, Mr. Brown has held prominent posts in the National Safety Council, American Society of Safety Engineers, the Greater New York Safety Council and the American Standards Association. He has also served on the Atomic Energy Commission's Safety and Health Board; accident prevention committees of the Edison Electric Institute and American Gas Association; the President's Conference on Occupational Safety and Governor Harriman's Safety Advisory Committee.

• • •

Du Pont's Elastomers Laboratory was honored recently for attaining the longest safety record in the company's history—more than 27 years without a lost-time injury to any employee. The honor was the company's highest—the Board of Directors' Safety Award—and was presented at a meeting of the entire staff in the Chestnut Run cafeteria by Pierre S. du Pont, 3rd, secretary of the company and a member of the Board.

• • •

At a special ceremony attended by its 1,000 Milwaukee employees, Inland Steel Products Company received four awards for outstanding accomplishments in industrial safety. The firm's employees have, for the third time in five years, attained a record of one and a half million manhours without a lost time accident.

In recognition of this achievement, the National Safety Council presented an Award of Merit, and three awards were made by Inland Steel's insurance carrier.

• • •

Jomac Products, Inc., of Warsaw, Indiana, a subsidiary of Jomac Inc., has received a safety award from its insurance carrier for 26 months without a lost-time accident. During the period, employees of the Jomac plant worked 320,319 hours without a lost-time accident.

• • •

Employees of the Chemstrand Corporation's nylon operations at Pensacola, Florida, achieved the goal of completing 8,371,266 safe man-hours of work. This represents 365 consecutive days of around-the-clock operation without a lost time injury. The Chemstrand employees

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(Use Key # Z-21 on Inquiry Card on page 75)

received a special achievement award of honor from the Florida Industrial Commission and an additional honor plaque from the company's insurance carrier.

• • •

Outstanding performances in the field of industrial safety have been recognized by the Executive Safety Committee at the Kaiser Aluminum plant in Halethorpe. Five plaques, signifying more than one-half million accident-free manhours, were presented to the departments compiling this significant record.

A remarkable achievement of more than five years without a lost manhour through accidents was established by the Shipping and Box Shop department. Awards for records of 100,000 consecutive accident-free manhours were received by the Mechanical Maintenance, Extrusion and Finishing departments. An award for 200,000 straight manhours without accident was received by the Administration department.

• • •

National Electric Products Corporation's Ambridge plant has received the National Safety Council's Award of Merit for 1955. The plant achieved a total of 1 million man-hours without a lost time injury. Last year the plant won the Award of Honor for completing 3 million no-accident hours.

• • •

Gas industry companies reduced their motor transportation accident rate 14 percent during the past year, the American Gas Association reported in announcing 15 awards won by the industry in the 25th annual National Fleet Safety Contest conducted by the National Safety Council.

An accident frequency rate of only 1.58 per 100,000 miles of operation was credited to the gas industry contestants with total operations of 291 million miles between July, 1955, and June, 1956. The rate for 1954–55 was 1.84.

The gas industry figure of 1.58 was exactly the same as the overall rate of the contest. The national average was 10 percent higher than in 1954–55, principally due to the inclusion of new fleets with higher accident rates.

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When a disastrous fire occurs on a weekend—as so many do—you may have your customers' sympathy but lose their business.
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Please send me complete information about the GUARDSMAN tape-recording watchclock.
You may send a DETEX Inspector to make a free, no-obligation survey of our plant protection needs.
Name
Company
Address
Title
SM-1
Consult the yellow pages of your telephone directory for your nearest Detex representative.
(Use Key # Z-22 on Inquiry Card on page 75)

The Manufacturing Chemists' Association, Inc., has won a 1956 American Society of Association Executives "Outstanding Activities" award for the safety program it conducts on behalf of the chemical industry.

The safety program, in effect 11 years, consists of publication of safety data sheets, collection and dissemination of safety statistics, presentation of annual awards to chemical companies with best safety records, publication of accident case histories, and cooperation with other groups interested in industrial safety.

Since the advent of the MCA safety program there has been "a regular and significant reduction in chemical industry accident frequency rate." Frequency rate for

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(Use Key # Z-24 on Inquiry Card on page 75)

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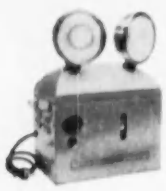

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(Use Key # Z-23 on Inquiry Card on page 75)

1955 was 3.25 per million man-hours worked—less than one third of the figure for "all manufacturing" as reported by the U. S. Department of Labor.

• • •

The President's Safety Award, the company's highest safety honor, was presented to the Wallingford (Conn.) Plant by K. C. Towe, President of American Cyanamid Company. This plant of the Company's Plastics & Resins Division, has operated for more than 4,390,000 man-hours without a disabling injury to any of its employees. Out of 35 Cyanamid plants, it is the seventh to earn this award.

Absorbents Research

The American Society for Testing Materials will soon initiate work in the area of mineral sorptive materials used for surface maintenance and safety. Following numerous requests from industry over the past two years and two conferences of interested parties representing consumers, producers, and general interests, a new technical committee on Mineral Sorptive Materials will be formed with the following scope: "The definition of terms and the formulation of test methods covering mineral sorptive materials used for surface maintenance and safety and the stimulation of research to accomplish the foregoing purposes." Greatest interest at present is in developing standard procedures for testing granular oil- and grease-absorbent materials such as those made from fuller's earth.

The organizational meeting will be held during ASTM Committee Week, February 4–8, 1957, at the Benjamin Franklin Hotel, Philadelphia. Anyone interested in the development of standard methods of test, definitions, and specifications for mineral sorptive materials will be welcome to send representatives to the organizational meeting. Further information may be obtained from ASTM Headquarters, 1916 Race St., Philadelphia 3, Pa. Consumers especially are urged to be present at the meeting.

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

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American Bar Ass'n, New Jersey Bar Ass'n,
Chairman, Committee on Workmen's
Compensation, New Jersey Bar Ass'n
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. . . . . Newark, N. J.

STRANGULATED HERNIA—Arising Out of Employment

The claimant was properly awarded compensation for a disability resulting from a strangulated hernia where there was sufficient evidence to show that the disability arose out of the employment although the claimant had sustained a hernia for some time before the condition became disabling. The medical evidence indicated that the condition originally resulted from the employee's work, lifting heavy milk and cream cans, and as a result of the exertion in the employment, the hernia became strangulated.

BALOW VS. KELLOGG CO-OPERATIVE CREAMERY ASSN., Minnesota Supreme Court. No. 72, July 6, 1956.

SAFETY APPLIANCE ACT—Faulty Hand Brake

A railroad brakeman was properly awarded $48,000 for injuries sustained when the hand brake on a flat car failed to release properly. There was sufficient evidence to sustain the jury finding that the employer failed to furnish an efficient hand brake. The claimant was injured when the hand brake stuck and then released suddenly, striking the claimant's arm with considerable force. The court held that under these circumstances the question of whether the employer had complied with the Safety Appliance Act provision that all cars be equipped with efficient hand brakes was a question of fact and the jury decision could not be disturbed. The court also held that the verdict was not excessive in view of the claimant's age, medical expenses, wages prior to the accident and extent of disability. Affirmed.

WILSON VS. PENNSYLVANIA RAILROAD CO., United States District Court, Western District of Penna. No. 12, 874, June 11, 1956.

MINER FOUND DEAD—Arising Out of Employment

The wife and children of a coal miner who was found dead at his post of labor were properly awarded death benefits where the employer failed to present any evidence to overcome the inference that the death arose out of the employment. The miner was found dead after having done an unusually heavy day's work. The position of body indicated that he was about to lift a load when he was stricken. The court held that where an employee is found dead at his place of employment the burden of proof rests on the employer and, in this case, the employer failed to sustain the burden of proof. Affirmed.

EUREKA CASUALTY CO. VS. PHILIPS, United States Court of Ap-

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(Use Key # Z-25 on Inquiry Card on page 75)

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Prevents death and injuries from falling.
Automatic: Positive. Will catch workman if he starts to fall even if unconscious.
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(Use Key # Z-26 on Inquiry Card on page 75)

peals, Sixth Circuit, No. 12, 717. June 8, 1956. Appeal from the United States District Court, Eastern District of Tennessee.

VACATION HEART ATTACK—Presumption of Causal Connection

The widow of a fire department employee, who died of a heart attack while on his vacation, was properly awarded death benefits where the statutory presumption that heart trouble which develops in a member of the fire department arises out of the employment was held applicable. The fact that the actual death occurred while the employee was on vacation did not affect the presumption of causal connection since the employee's exposure to smoke and fumes had already taken place. The employer maintained that the statute did not apply to the decedent because he was ordinarily employed in the office of the fire department and only worked outside 15 to 18 weeks a year. The court held that the statute was not limited to employees who were in constant contact with the hazards of fire and that the testimony of the decedent's wife and doctor indicated that he had shown symptoms of overexposure. Affirmed.

CITY AND COUNTY OF SAN FRANCISCO VS. INDUSTRIAL ACCIDENT COMMISSION, California District Court of Appeals, First District, First Divisions. No. 16, 695, June 25, 1956.

Maintenance Men
(from page 13)

ule. The expense resulting from these periodic inspections has been offset by the preventive measures utilized to keep our work stoppage and personnel injuries to a minimum.

In addition to the other factors, of great importance in our maintenance work is the inspection of the work site by maintenance, safety, and location supervisors in all dangerous areas.

Maintenance personnel are equipped with protective clothing and equipment and are ardent users where they find it necessary for personal protection.

If, by now, we have realized the important role our maintenance men play in safety and production, then we should recognize them by every conceivable means and keep them on our accident prevention team.

The future of our various organizations depends on safety and in turn the people responsible for accident prevention. New processes demand that safety be built in and not tacked on, so give the behind-the-scenes maintenance men both help and credit to ensure that your production schedules are met without loss of time and costly injuries to your employees.

Vision and **foresight** are important, but never fail to **recognize** and **commend**—blended together, these four ingredients will give you a well oiled plant "production" machine.

REACH All Overhead Valves without DANGER! REACH for Babbitt

Adjustable **SPROCKET RIM** *with Chain Guide*

- Eliminate dangerous catwalks, ladders, balconies, boxes, stools, etc.
- Prevent accidents, protect personnel
- Reach inaccessible areas easily
- Operate every valve from plant floor
- Easy to install and operate
- No maintenance; first cost, only cost
- Easy instructions with each unit
- Packed, completely assembled, one to a carton
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- Your supplier carries complete stock
- Write for new descriptive Catalog sheet and prices:

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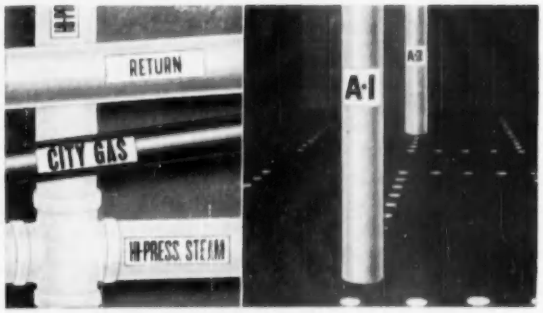
(Use Key # Z-27 on Inquiry Card on page 75)

Self-Sticking Markers Cut Maintenance Time and Costs



Self-Sticking Markers which cut maintenance time and costs are available from the W. H. Brady Co., Milwaukee. One of their widely-used products, ALL-TEMPERATURE PIPE MARKERS, stick permanently to pipes as hot as 300°F. Millions of them in use in plants of all types today. They conform to ASA standards and give you a fool-proof, cost-cutting method of pipe identification. Write for Bulletin No. 135-B.

Brady Self-Sticking DOTTED LINE AISLE MARKERS offer a fast, low-cost way to mark aisles. They are so tough they outwear painted lines 5 to 1. Miles and miles of aisles are marked with these markers in plants everywhere. Write for Bulletin No. 141.

A quick, economical method for marking areas, bays, posts, bins, pallets, etc., is found in Brady Self-Sticking All-Purpose NUMBERS and LETTERS. These individual NUMBERS and LETTERS let you make up any combination of markings right on the spot. Stocked in six sizes, these handy Markers fit many plantwide Marking needs perfectly. Write for Bulletin No. 165.

Manufacturer: W. H. Brady Co., 773 W. Glendale, Milwaukee 9, Wis.

(Use Key # Z-39 on Inquiry Card on page 75)

THE FIRE FRONT

Standards for Inerting

Standards for Inerting for Fire and Explosion Prevention, NFPA No. 69, have been published by the National Fire Protection Association. The new text supercedes an earlier edition of the same standard and is completely revised.

NFPA No. 69 covers various inerting methods including the use of nitrogen, carbon dioxide and other gases intended for use in processing equipment to displace oxygen and render the atmosphere nonexplosive. It also goes into details as to the methods of production of inert gases and specifies all necessary safeguards for a complete installation.

These standards were developed by a representative national committee under the chairmanship of James J. Duggan of the Carbide and Carbon Chemicals Company, South Charleston, W. Va.

This pamphlet, 46 pages, is available from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass., at 50 cents.

Sodium Hydride Descaling

In the metalworking industry there is often need for removal of rust and oxide scale from steel, copper, and other ferrous and non-ferrous metals and alloys. One chemical descaling method uses sodium hydride, a strong reducing agent, to clean metals by a process which, in principle, simply reverses the oxidizing action which forms scale and rust. It raises some special fire problems according to a recent bulletin of the National Board of Fire Underwriters.

The descaling bath consists of molten sodium hydroxide (caustic soda) normally containing 1½ to 2% sodium hydride and operating at a temperature of 700° F. Work to be cleaned is lowered into the bath for a short time, taken from the bath and quenched in water to remove most of the reduced scale. A short acid dip, followed by a high pressure water rinse, is used if a bright metal surface is desired.

Sodium hydride necessary for operation of the process is made by directly reacting sodium and hydrogen in a generator box in the sodium hydroxide bath. The sodium hydride dissolves in the molten sodium hydroxide bath and diffuses uniformly into the bath from the bottom of the generator. Since the chemical reduction process uses up sodium hydride, it must be generated continuously. Formation of the hydride is regulated by the rate of feed of sodium to the generator box.

The caustic tank is constructed of low carbon steel and contains heating elements to keep the bath in a molten state. Heaters may be of any standard type used for heating salt baths; gas, oil, and electric heaters have all been used for this purpose.

The sodium hydride generator consists of a steel box, open on the bottom, and immersed in the caustic bath so that little more than its top is above the surface. As needed, bricks of metallic sodium are fed through a charging door in the top of the box into the molten caustic. There the sodium melts, forming a layer on the surface. Hydrogen gas, piped into the box, is allowed to bubble up through the sodium, reacting to form sodium hydride. Excess hydrogen escapes through a small opening in the top of the generator box where it is burned to eliminate any explosion hazard.

Hazards Involved

The hazards of the hydride process are those arising from use of the molten caustic bath, the combustible, reactive metal, sodium, and the flammable gas, hydrogen.

Caustic soda is a strong alkali and in its molten state can cause both severe chemical and thermal burns. Perhaps the greatest hazard to firemen is the danger of violent steam explosions which might result if hose streams were inadvertently directed into the hot caustic, which is at a temperature much above the boiling point of water. Safety precautions for operating fused baths and for fire fighting in their vicinity are given in NBFU Research Report No. 2, "Potential Hazards in Molten Salt Baths for Heat Treatment of Metals."

Water must also be kept away from sodium, since the two react together with explosive violence. Sodium barrels, both empty and full, should be kept closed and stored in a dry, clean, noncombustible building or cut-off room. No automatic sprinklers or use of water should be allowed in the storage area.

Hydrogen for the process can be obtained from cylinders, from any

October Losses Rise

Estimated fire losses in the United States during October amounted to $81,121,000, the National Board of Fire Underwriters has reported. This $81,121,000 loss represents an increase of 15.7 percent over losses of $70,118,000 reported for September (1956) and an increase of 38 percent over losses of $58,778,000 reported for October, 1955.

Losses for the first 10 months of 1956 now total $812,324,000 an increase of 11.7 percent over the first 10 months of 1955, when they amounted to $727,222,000. These estimated losses include an allowance for uninsured and unreported losses.

dry gas mixture containing hydrogen but free of oxygen, carbon monoxide, carbon dioxide, and water vapor, or from dissociation of ammonia.

Ammonia dissociation equipment is designed to break down ammonia into its constituents, hydrogen and nitrogen. This equipment is frequently used in metal-working plants to produce suitable atmospheres for heat-treating furnaces and may also be used to supply hydrogen for a sodium hydride descaling bath.

The principal fuel in a fire involving an ammonia dissociator is usually either hydrogen or ammonia. Consequently, shutting off the gas supply is recommended where possible. Dry powder extinguishers may be used to extinguish the gas fire if necessary to reach control valves; but putting out the fire before the gas is shut off introduces the possibility of reignition and explosion of the leaking gas. These extinguishers are also suitable for secondary fires in the electrical equipment of the dissociators.

1 Million Fires in '55

This country's fire losses reached their highest total in 1955. The record dollar loss total of $1,140,768,000 was an increase of $124,000,000 over the previous year's fire losses, the National Fire Protection Association reported in its recently-published annual classification of United States fires and fire losses.

"Principal factors responsible for the increase," according to the Association's study, are "the $31,000,000 increase in the 'large loss fire' losses (those fires of $250,000 or more loss each), the $28,500,000 increase in forest fire losses and the $20,000,000 increase in aircraft losses.

The NFPA compiles estimates of the nation's fire and fire losses on the basis of reports from federal, state and local fire authorities as well as from industrial and other sources concerned with fires.

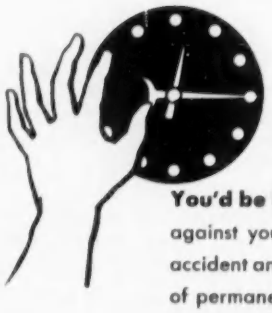
There were an estimated total of 1,977,950 fires of all types, it was stated. This total broke down to 811,800 building fires which caused $943,551,000 damage.

"An additional 1,166,150 fires," the study added, "not involving buildings—aircraft, motor vehicles, forest, ships, rubbish, grass fires, etc.—accounted for an estimated $197,217,000."

The NFPA said that the 1955 total of building fires is a 4.8 percent increase over the 1954 total, and the dollar loss of such fires is up 7.8 percent over that year.

The leading causes of fires in 1955 in buildings according to the Association's estimates are: careless smoking and matches—122,000 fires; defective or overheated heating and cooking equipment—100,500 fires; electrical—99,900 fires; rubbish, ignition unknown—59,400 fires; flammable liquids—45,500 fires; lightning—44,800 fires; defective or overheated chimneys and flues—37,500 fires; children and matches—29,900 fires.

Reprints of the study are available from the NFPA Publications Department, 60 Batterymarch St., Boston 10, Mass., at 25 cents.



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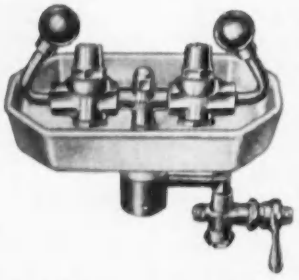

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(Use Key # Z-28 on Inquiry Card on page 75)

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SAFETY SIGNS FOR *ALL PURPOSES*

STANDARD SIGNS, INC.
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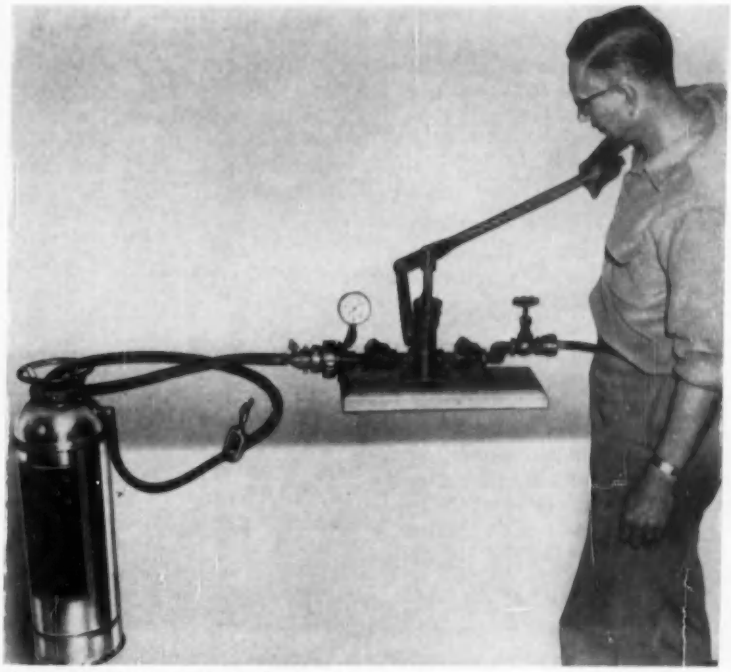
(Use Key # Z-29 on Inquiry Card on page 75)

Old and weak fire extinguishers that, like this one, burst in use are very dangerous.



Hydrostatic tests are now virtually mandatory each five years on soda-acid, water, foam and loaded stream extinguishers. Power or hand-operated pumps are approved for tests.

Why TEST Extinguishers?

Old and weak fire extinguishers that sometimes explode when they are used will soon become things of the past. The National Fire Protection Association has taken a long step toward eventual elimination of these hazards by making hydrostatic pressure testing of certain types mandatory every five years.

This is revealed in NFPA's revised manual No. 10, "Standards for the Installation, Maintenance and Use of First Aid Fire Appliances."

In the manual the NFPA states that hydrostatic tests **must** be made on soda-acid, water, foam and loaded stream extinguishers.

Until the revised copy of the manual was issued, the NFPA said merely that these tests "should" be made. The new manual states that they "shall." Since NFPA regulations normally are incorporated into the fire codes of 90 per cent of the nation's municipalities, the proviso is expected to become an almost universal law.

WHO SHOULD MAKE TESTS?

The NFPA manual says that these tests will be conducted by:

1. **The manufacturer of the extinguisher.**
2. **A qualified service agency.**
3. **A qualified testing laboratory.**
4. **The user of the extinguisher (if competent personnel and facilities are available).**

Municipal and industrial fire department officials long have been concerned over extinguishers which burst on application and sometimes result in serious injury. Only recently, a North Carolina fireman's leg was amputated after it was injured by an exploding extinguisher.

The hazard is due to several factors. Some buildings still have extinguishers as much as 30 or 40 years old. Metal fatigue builds up over a period of time, weakening the extinguishers. Rough handling during recharging and use also helps to weaken them. Then, when the extinguishers are used in emergencies, they can't resist the internal pressures that are built up.

No one has accurately determined just how many extinguishers now hanging on walls will be eliminated by the test. However, a Fyr-Fyter Company representative found that one of every five units pressure tested in a recent survey either exploded or leaked.

The NFPA recommends the use of a "suitable hand-operated or power-operated hydrostatic pump capable of producing pressure

HERE IS THE TEST
(quoted from the NFPA Manual #10)

"Pressure shall be applied at a rate of rise to reach 300 pounds per square inch in approximately one minute. Pressure of not less than 300 pounds per square inch and not more than 350 pounds shall be applied to hand types and a pressure of 400 pounds to wheeled types.

"The extinguisher should be checked for leakage, distortion, or other signs of failure. Pressure shall be held for one minute, after which pressure shall be released."

preferably not less than twice the pressure test." At no time should an air pressure pump be used, since violent rupturing will result in case of failure.

Flexible Connection

A flexible connection attached to the pump, and provided with a fitting for attachment to the extinguisher, is recommended. It is preferable that this be a clamp type fitting capable of connection to the discharge nozzle of the extinguisher, says the manual. This will test the complete extinguisher assembly including the hose, except on wheeled units in which case the nozzle is removed and complete remaining assembly (including hose) is tested. Other suggested equipment:

1. A calibrated pressure gage with a capacity preferably not less than twice the test pressure.

2. Necessary valves, fitting, etc., for regulating and maintaining the required test pressures.

3. A substantial shield which should be placed between the extinguisher under test and the operator of the pump.

In preparing for the test, the extinguisher "shall be emptied and washed. The internal parts such as acid bottle and cage shall be removed."

Before applying pressure, the extinguisher must be filled with water. Care must be exercised to be sure no air is trapped in the extinguisher during the test. Otherwise, violent rupturing may occur in case of failure.

Any extinguisher showing leakage, distortion or other signs of weakness should be repaired by the manufacturer or his authorized agent or discarded, says the NFPA. Others may be recharged and returned to normal service.

The latter extinguishers are to be fitted with a record tag of metal or equally durable material. On the tag will appear the date of test, test pressure and name or initial of the person who made the test.

Pictures by courtesy of the Fyr-Fyter Co.

Testing Facilities

The facilities of the Factory Mutual Laboratories are now being made available on a contract basis to organizations seeking help in product development or other research, according to a recent announcement by Norman J. Thompson, Director. These laboratories have for 70 years been conducting research.

An expansion program in recent years has resulted in a modern laboratories building and an extensively developed fire and research testing station. Present-day facilities afford unusual opportunities not only to investigate fire and explosion phenomena, but also to undertake development in other fields, particularly in hydraulics, heat transmission, combustion processes and auto-oxidation.

Anyone interested in knowing more about the available facilities is invited to address a request for a copy of the new descriptive booklet, "Research and Testing" to the Factory Mutual Laboratories, P. O. Box 510, Norwood, Massachusetts.

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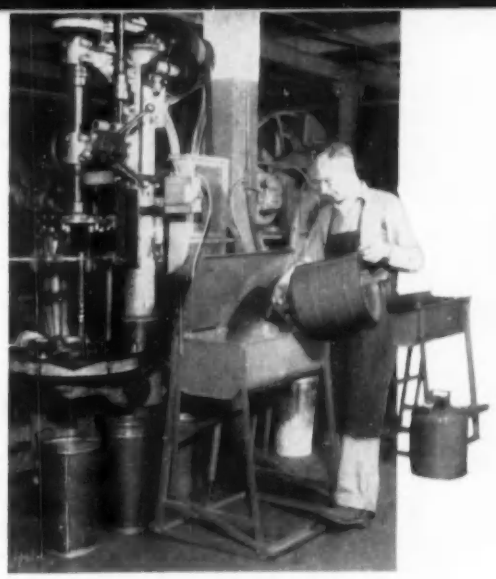
A GUIDE TO HANDLING FLAMMABLE LIQUIDS



How to handle them safely within the plant.
How to construct a safe drum-storage room.
How to transfer flammables safely.

The volatile nature of all flammable liquids has established the principle: only approved fire preventive closed-type containers should be used for these liquids within the plant. Whenever open containers are employed vapors are constantly escaping into the air where they may be easily ignited by a chance spark to spread fire and destruction to plant and workers. When transferring these liquids from storage areas to use containers and to points of intermediate storage, therefore, it is essential that one of the several different types of protected carriers be employed.

If the end uses are first carefully considered, it will be helpful in determining the most efficient and practical means of transferring flammable liquid to the points of use within the plant.

END USE 1: Machining and Maintenance Departments. In these departments where various types of large capacity manual and automatic wash tanks are employed for cleaning and degreasing operations, the approved "safety can" is effectively used for refilling operations. This safety container has a relatively large spout for quick, controlled pouring of larger quantities of flammable solvents and is generally available in capacities from 1 pint to 5 gallons. (See Model 1 at bottom of next page) The spout is closed by a spring-mounted, leakproof cap which is operated by a squeeze-type carrying handle. There is no possibility of leakage even when the can is inverted. The spring mounting of the cap insures automatic pressure relief. The can opens completely away from the line of the spout to provide full clearance for filling with either a hose nozzle or faucet.

Safe practice requires a fire baffle in the pouring spout to guard against fire and explosion when filling or pouring. An effective fire baffle should be ruggedly constructed to prevent damage by careless insertion of filling nozzle. The two piece construction of perforated metal has proven the most effective type. The primary function of the flame arrester is to prevent

Dispensing solvents into smaller, machine-side containers.

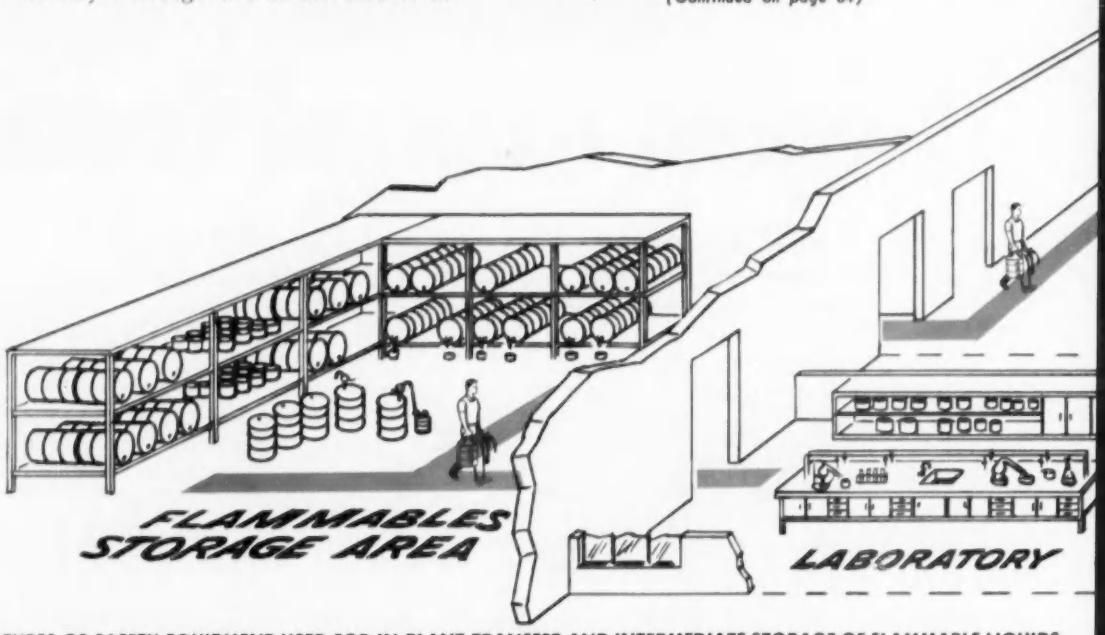
the propagation of fire into the container by absorbing and dissipating the heat of fire before it reaches the flammable liquid. The fire baffle should, therefore, be considered essential protective equipment and be required on all dispensing containers.

END USE 2: Production Lines. Production lines usually contain a large number of smaller capacity operating containers such as bench cans, plunger cans and swab cans. To fill these containers, the dispensing unit should be equipped with a flexible metal spout for pouring into smaller openings without spillage, and to eliminate the dangerous practice of filling with a funnel. These "supply can" types are available in sizes ranging from 1 to 5 gallons with flexible metal hoses of varying diameters and lengths. (See Model 2) Both fill opening and pouring spout have perforated double wall metal fire baffles to prevent ignition of contents. An easy working valve at the base of the flexible spout is operated by the carrying hand to give positive control while pouring.

Where production line operations require the use of materials of high viscosity, such as rubber cement, it is advisable to use specially designed, combination storage and dispensing containers which are filled at the storage area. These "viscose material" type containers are available in 5 and 10 gallon capacities with quick-opening, non-dripping gate valves for convenient dispensing into assembly line containers. (See Model 4)

END USE 3: The Finishing Line. Finishing lines frequently contain small touch-up containers with a limited capacity of solvent fluid for removing spots, cleaning small delicate parts, removing stains and for paint touch-up work. These containers require a much smaller filling container with a long, smaller I.D.

(Continued on page 64)



TYPES OF SAFETY EQUIPMENT USED FOR IN-PLANT TRANSFER AND INTERMEDIATE STORAGE OF FLAMMABLE LIQUIDS

(Key numbers below designate choice of equipment in chart at right)

1 SAFETY CAN

2 SUPPLY CAN

3 SMALL RECEPTACLES FILLER CAN

4 VISCOUS MATERIAL CAN

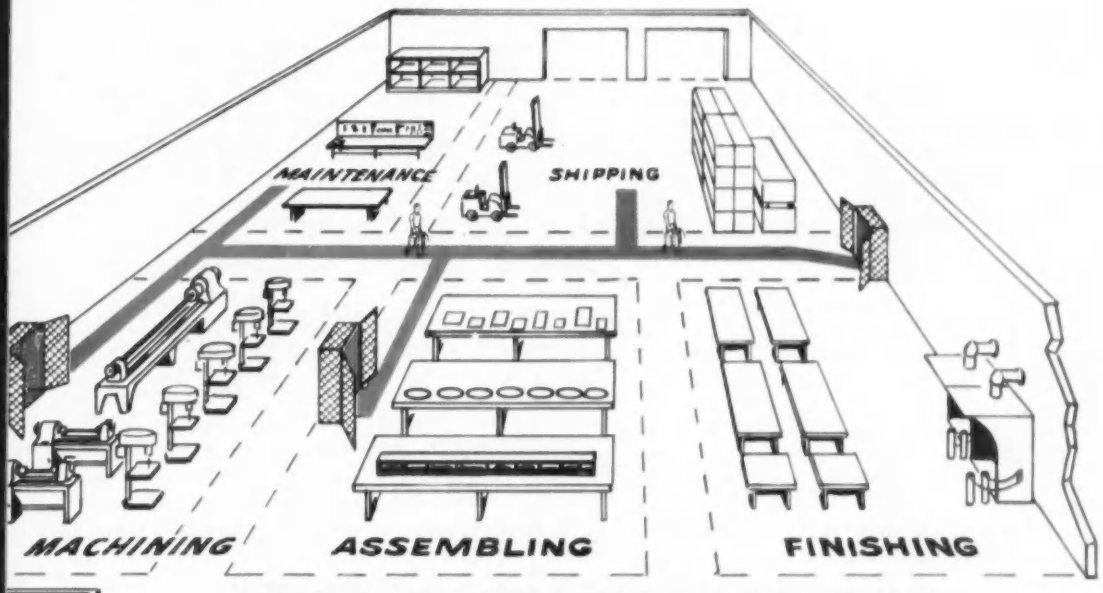
5 OVAL SHAPE SHELF CAN

6 SAFETY CAN WITH BOTTOM FAUCET

7 SAFETY CAN WITH TOP FAUCET AND TILT FRAME

8 STORAGE CABINET

Diagram of In-Plant Uses & Storage of Flammable Liquids



PRODUCTION OPERATIONS

KEY TO SELECTING SAFETY EQUIPMENT FOR IN-PLANT TRANSFER AND INTERMEDIATE STORAGE OF FLAMMABLE LIQUIDS

Transfer Route of Flammables from Storage Area to Various Plant Departments

Intermediate Storage Points for Flammables Stored At-the-job

Plant Department	Operations Key To Choice Of Safety Equipment	Choice Of Safety Equipment (Numbers refer to equipment shown at left)
MACHINING	(A) Dispensing solvents into degreasing tanks (B) Dispensing solvents into smaller machine-side wash and dip tanks (C) Storage of all flammables containers for convenient at-the-job use	1 2–6–7 8
ASSEMBLING	(A) Dispensing solvents into bench containers used in assembly operations (B) Dispensing rubber cement for assembling fabricated parts (C) Storage of all flammables containers for convenient at-the-job use	2–3–6–7 4 8
FINISHING	(A) Dispensing solvents into tanks used to protect paint brushes (B) Dispensing solvents into smaller containers used to protect spray guns (C) Dispensing flammables into small touch-up cans (D) Dispensing thinners into paint mixing vessels for spraying (E) Storage of all flammables containers for convenient at-the-job use	1 2–3–6–7 3 1–2 8
LABORATORY*	(A) Dispensing flammables into beakers, test tubes and other receptacles (B) Dispensing viscous materials (C) Storage of small quantities of many samples of liquids (D) Storage of all flammables containers for convenient at-the-job use	2–3–6–7 4 5 8
MAINTENANCE	(A) Dispensing solvents into cleaning and washing tanks (B) Dispensing solvents into smaller work bench containers (C) Dispensing rubber cement used in repair work (D) Storage of all flammables containers for convenient at-the-job use	1 2–6–7 4 8
SHIPPING	(A) Re-fueling lift trucks and other gasoline and diesel powered vehicles (B) Dispensing viscous materials used in packing and labeling (C) Storage of all flammables containers for convenient at-the-job use	2 4 8

*Containers used in Laboratory Operations should be carefully selected to provide not only the proper design, but also the most effective construction. Frequently, special metals such as monel metal and stainless steel are necessary in the construction of these containers to prevent corrosion and to keep liquids chemically pure.

flexible spout for replenishing the liquid without overflow or spillage. These "small receptacles filler containers" are usually only 1 gallon in capacity with either ¼ inch or ⅜ inch flexible hose. (See Model 3) Pouring is controlled by a squeeze grip handle which actuates both valve and air pressure vent. A perforated metal double wall fire baffle protects the filler opening.

To replenish solvents in spray gun and paint brush immersion tanks used to keep paint from hardening, the "supply can" type or the "safety can" type is suitable.

END USE 4: The Laboratory. Laboratory operations generally require smaller capacity transfer and dispensing containers with long, smaller I.D. flexible spouts for controlled pouring into small receptacles such as beakers, test tubes and 1 gallon sample storage containers. Here, again, the safety "supply can" type or the "small receptacles filler can" type are ideally suited. Frequently, special metals such as monel and stainless steel should be specified in the construction of these containers to prevent contamination of chemical contents and to retard corrosion. Moreover, these containers are generally of an oval shape to conserve limited storage space available in the laboratory. (See Model 5)

To safely store and dispense larger quantities of hazardous liquids within the laboratory, there are available stationary reservoir type dispensing containers equipped with automatic, self-closing safety faucets to dispense into lab containers without chance of spillage or overflow. (See Model 6) One such container, with the safety faucet at the top, is mounted on a metal frame which permits the entire container to be tilted for accurate, dripless dispensing. (See Model 7) Both the fill openings and the faucet openings of these containers are protected against fire and explosion by safety fire baffles.

END USE 5: Shipping Department. Where delivery trucks, tractors and lift trucks are used for in-plant operations, it is advisable to store supplies of fuel in the "supply can" type of safety container. The flexible metal hose attachment reduces the danger of spillage or overflow on hot engines or exhaust pipes when refueling. All in-plant refueling operations should be safeguarded by the use of safety fill fittings on fuel tanks of gasoline or diesel powered vehicles.

At-the-job Intermediate Storage. The National Fire Protection Association has supplied specifications for specially constructed cabinets to permit storage of larger quantities of flammables (up to 50 gallons) at the point-of-use. However, flammables so stored should first be placed in approved safety containers of not more than 5 gallon capacity each, such as those described previously in this article. Cabinets which comply with these recommendations are available and have been approved by the Fire Chiefs of many cities.

Many plants find these storage cabinets of advantage:

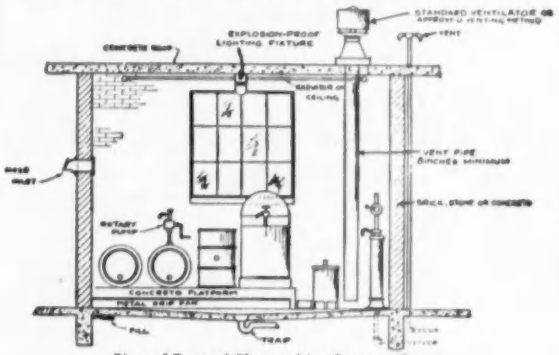
(1) to save dispensing time and permit a quick refilling of use containers without delaying production,

(2) to provide better control of odd lots of flammables and prevent the scattering of miscellaneous flammables containers.

Drum Storage and Dispensing

Parts cleaning liquids, grease and oil solvents, evaporative liquids used as carriers for rust preventive and other coating processes, thinners, and similar flammable fluids are usually received from the supplier in 55-gallon steel drums. When large quantities are required, these drums are often stored on racks in a convenient location either within or without the plant. Smaller numbers of drums are generally placed in special storage rooms or vaults constructed so as to be completely isolated from the plant proper.

These flammable storage rooms should have thick, fire-resisting concrete or brick walls, ceiling and floor, a raised sill, and be equipped with a standard fire door. Only an explosion-proof lighting fixture should be used within the room, and the light switch and



Plan of Typical Flammables Storage Room

fuse box are to be located outside. The floor may be slanted toward the center and provided with a drain to prevent the accumulation of spilled liquids, and the room must be provided with a ventilator or approved venting system. If there are windows, they should have standard steel sash with wire glass and be of the explosion type which open outward.

When drums are stored on racks, either within or without the plant building, it is advisable that they be placed on their sides, end to end, with the end bung opening toward the aisle side and the side bung opening toward the top. Immediately upon receipt, all drums should be equipped with pressure and vacuum relief fittings which replace the bung at the side of the drum. The pressure relief valve is set to relieve vapor pressures at 3½ lbs. per square inch and the valve closes automatically when internal pressure drops below this point to lessen evaporation and minimize loss. An important feature of these fittings is the metal plate fire baffle structures which prevent exterior sources of ignition from igniting the vapor content within the drum.

The importance of pressure relief for drums, whether located within or without the plant, cannot be over-estimated. Heat causes the volatile liquid to expand to a far greater extent than the container can withstand and the ignition of these vapors under pressure may result in an explosion with destruction similar to that caused by a boiler explosion.

Vacuum relief is also necessary to permit rapid and convenient withdrawal of liquid from the drums. If this relief is not provided, there will only be a trickle of liquid when the faucet is opened because the

atmospheric pressure within the drum is not sufficient to force movement. Vacuum relief maintains a balanced atmospheric pressure within the drums at all times to permit the free flow of the liquid.

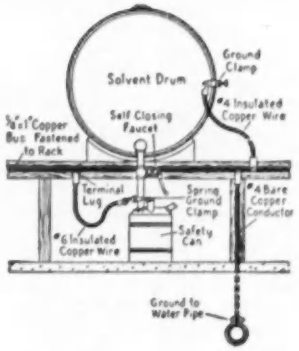
Refilling Storage Containers

When storage drums are used as permanent dispensing containers and are refilled from time to time, fire protective refilling fittings are necessary. In such cases, the pressure and vacuum relief fitting required for storage purposes only should be replaced by a special fitting which incorporates fire protection for safe refilling in addition to pressure and vacuum relief. In these fittings a double, perforated brass fire baffle is included which extends deep into the drum. The fire baffle which prevents fire from entering the drum during refilling operations is threaded into the cap assembly containing the pressure and vacuum relief valves; it can be easily removed for inspection and cleaning.

Although the storage of large quantities of flammable liquids seems to present exceptional fire and explosion hazards, these are easily controlled by the provisions which have been described. The greatest fire hazard occurs in transferring flammable liquids from storage to the various types of containers used within the plant for production processes.

This is largely due to the existence within the plant of static electricity which is created in practically every type of manufacturing process in every industry. The generation of static electricity cannot be prevented. It is produced throughout the plant by the continuous contact and separation of two substances which are dissimilar in nature. A rapidly moving belt develops static electricity by coming in contact with the pulley and then moving away from the pulley. Paper and cloth passing through machines take on static charges. Paint spraying generates static and even dry materials sliding down a metal or wooden chute become charged. **Static electricity is also produced by the transfer of liquids from one container to another.** Unfortunately it cannot be seen, and plant personnel may be unaware of its presence until a static spark ignites an unseen vapor which bursts into sudden flame.

Although the generation of static electricity cannot be prevented, dangerous accumulations can be avoided by grounding, bonding, humidification or ionization. The most effective method is to ground



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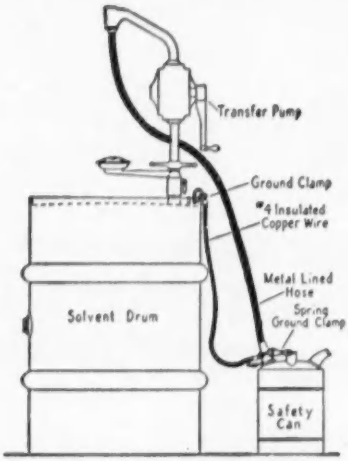
the metal parts of a machine or container to a water pipe or buried metal plate (see drawing) so that the static flows away as it is generated and is not permitted to accumulate.

Transferring Flammable Liquids

In transferring flammable liquids from storage drums, therefore, it is recommended that a fully protected transfer pump be used, or a special fire preventive faucet. The type of transfer pump which provides complete safety is one which has three flame arresters built into it as an integral part of the pump. These flame arresters are located at the exact points necessary to prevent an explosion of vapors—at the spout, above the bung adapter, and at the strainer inlet within the drum. In addition, provision is made for pressure and vacuum relief through protected openings in the bung adapter. Construction must be of nonferrous metals to prevent sparking. One such pump is of special aluminum alloy with a brass telescopic tube equipped with swivel grip connectors for attaching to either the side opening or end opening of



the drum. The hose is Underwriters' Laboratory approved and is static free. Pumping speed is 5 gallons per minute—fast enough for filling small containers, yet sufficiently slow to prevent sudden overflow. It is designed to be attached to a ¾" opening and an adapter permits attachment to larger openings.

The self-closing safety faucet for transferring flammable liquids directly from the drum has a perforated brass flame arrester within the opening of the dispensing end where it prevents the entrance of exterior fire into the drum, acts as a strainer, and may be easily removed for cleaning or replacement without unscrewing the faucet. This faucet may be used with any type container that has a ¾ in. bung opening. One type is self-positioning. A swivel head permits the faucet to be screwed into the bung opening and when a firm, tight threaded connection is secured, the pouring spout is easily swiveled to the correct position for use and tightened with a knurled locking nut. When tightened, the locking nut compresses a teflon-asbestos packing composition to prevent leakage at the swivel connection. Synthetic rubber faucet gaskets recommendations for various liquids are given

Safety Can with Self-Closing Faucet.

in the accompanying table. A spring-mounted handle permits dispensing only when attendant is present. Flow of liquid stops completely when handle pressure is removed and there is no possibility of attendant leaving the liquid running to permit overflow to gather on floors where it may be easily ignited. Flexible hose attachments of various lengths are available for filling containers with small openings and these have the additional advantage of making a ground connection between the faucet and the edge of the container which prevents the accumulation of the static electricity created by the movement of the liquid. A rigid type safety faucet is also available.

Nevertheless, there is always the possibility of momentary inattention by the attendant or overflow when filling dispensing containers, and it is therefore advisable that a safety drip can be placed on the floor beneath the faucet. This safety drip can has a perforated metal fire baffle welded to a removable cover to prevent a spark or flash from igniting the drippings it receives. The cover is easily removed for emptying and cleaning the can.

Pictures and source material by courtesy of the Protectoseal Co.

General Synthetic Rubber Recommendations

FOR FAUCET GASKETS

LIQUID	N	T	LIQUID	N	T
Acetone		✓	Isopropyl Acetate		✓
Amyl Acetate		✓	Kerosene		✓
Amyl Alcohol	✓		Lactol Spirits		✓
Benzene (Benzol)		✓	Linseed Oil	✓	
Benzene (VMP Naphtha)		✓	Lubricating Oil	✓	
Butyl Acetate		✓	Methyl Alcohol (Methanol)	✓	
Butyl Alcohol	✓		Methyl Ethyl Ketone		✓
Carbon Tetrachloride		✓	Naphtha, Petroleum		✓
Dibutyl Phtalate		✓	Stoddard Solvent		✓
Ethyl Acetate		✓	Toluene (Toluol)		✓
Ethyl Alcohol (Ethanol)	✓		Trichlorethylene		✓
Ethyl Ether		✓	Tung Oil	✓	
Ethylene Glycol	✓		Turpentine		✓
Fuel Oil		✓	Wood Alcohol	✓	
Gasoline		✓	Xylene (Xylol)		✓

STOWE SALES COMPANY, Phoenix, Ariz., has been appointed to handle sales and service of *Four Wheel Drive Auto Company* fire engines and fire apparatus in the state of Arizona, it was announced by *G. F. DeCoursin*, FWD vice president-sales.

Robert Chandler, vice president of Stowe Sales Company, said his firm is offering the firefighting equipment either by outright sale or on FWD's exclusive lease plan arrangement.

MACWHYTE COMPANY, manufacturers of wire rope, have announced that effective immediately, *Mr. Russell J. Whyte* has been appointed Field Sales Manager for the company. Mr. Whyte for the past twelve years has been a District Factory Representative in California, and prior to this was employed in product engineering work. In all, he has 21 years of service with the company. He will report directly to the Vice President in Charge of Sales, and will be responsible for all field sales activities and for distributor and customer relations conducted from Kenosha.

President *Adam Breuer* of the *BREUER ELECTRIC MFG. CO.* has announced the appointment of *Robert L. Kline* as the company's new General Sales Manager. Mr. Kline will supervise all sales for the company's complete line of heavy duty and noiseless vacuum cleaners, floor scrubbing machines, portable electric blowers, and dust collectors.

With a past history of 28 years in the sale of floor maintenance equipment, Kline has, since 1949, been the Breuer Regional Sales Manager for the West Coast and the western provinces of Canada. New Regional Sales Manager for the West Coast will be *Frank Young*, formerly associated with Richter Engineering Company of Los Angeles.

THE BENNETT MANUFACTURING CO., Alden, N. Y., manufacturers of a complete line of waste receptacles, announces the appointment of *Henry Schwartz* as their representative in the metropolitan New York area.

Mr. Schwartz has been in the janitor supply field since 1935. His business address is Box 12, Little Neck 62, N. Y.

GENERAL ELECTRIC CO. has announced the creation of a new operating department, known as the General Electric Communication Products Department, which will absorb functions previously handled by the company's Communication Equipment Section. Products of the new department will include mobile radio, microwave radio relay, radio traffic coordination units, power line carrier equipment, terminal equipment and other communication systems.

The announcement was made by *Harold A. Strickland, Jr.*, general manager of the firm's Industrial Electronics Division, who disclosed concurrently that *Harrison Van Aken, Jr.*, has been promoted to the position of general manager of the new organization.

The Materials Handling Division, THE YALE & TOWNE MANUFACTURING CO. has announced the appointment of *Garnett A. Vining* as Western Regional Sales Manager.

Formerly manager of Yale gas powered industrial truck sales, Vining will have supervisory control of Yale activities in the 11 most western states and northwestern Canada, with headquarters in San Francisco.

THE HEWSON COMPANY announces the appointment of the Carse Electric Corporation, 1044 Broadway, Albany, New York, to handle sales, field application and servicing of its line of high voltage insulation test sets and power supplies; static control systems; and ground controls in Eastern New York, Vermont and Western Massachusetts.

A new service to the business community, Management Consultation In Industrial Fire Protection, is offered by a New York firm, *SENTRY SAFETY SERVICE*.

Inspired by the growing awareness of the importance of industrial fire protection, and disturbed by the appalling yearly losses in lives, property, and production time, caused by fire, Sentry has

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EXCLUSIVE WHITE KNEE BOOTS. Ideal for dairies, food processors, ice cream manufacturers, chemical plants, meat packers, petroleum industries, etc.

- **Plain or steel toe**
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- **Fully lined**
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Sizes 6 to 13

BLACK KNEE BOOTS

Plain or steel toe. Fully lined, soft sponge innersole, heavy duty heel and sole. Scientifically designed for wearer's complete comfort.

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SCIENTIFIC INDUSTRIAL SUPPLY CO.

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(Use Key # Z-34 on Inquiry Card on page 75)

organized a staff of skilled Fire Inspector-Instructors. These men are prepared to assist the businessman with any fire problem, however large or small.

One of the services offered by this firm is training of plant fire brigades. Sentry has a staff of instructors and a comprehensive study course available with courses tailored to meet individual plant requirements.

THE MARKET FORGE CO. of Everett, Mass., announces the sale of its *Materials Handling Division* to *THE AMERICAN PULLEY CO.* of Philadelphia, Pa. This move was made necessary by the rapid growth of the Market Forge Company over the past several years and the need to devote its full plant and facilities to its other divisions. The American Pulley Company will manufacture its newly acquired Market Forge materials-handling line in its recently expanded plant in Philadelphia.

Nathaniel Warshaw, who is responsible for the development of the Market Forge Company's line, will join The American Pulley Company in the capacity of Manager of its Materials-Handling Division.

A series of fluorescent lighting clinics are being conducted by lighting specialists of *SYLVANIA ELECTRIC PRODUCTS INC.*, in 11 major cities of the United States this winter.

A team of lighting specialists from the company's Lighting Division headquarters in Salem, Mass., and from the company's sales districts, are participating in the clinics in the Midwest, Far West and South. Demonstrations, discussions and "trouble-shooting" sessions are being scheduled with local groups in each of the areas. Problems of installations, specifications, and design features of various types of fluorescent lamps and fixtures are covered in the meetings.

AMP INC. has been announced as the new official designation of Aircraft-Marine Products, Harrisburg, Pennsylvania. Widespread industrial acceptance of solderless termination in the post-war years has obsoleted the restricted corporate title in use since the company's beginning.

Safety Appointments

Eugene L. Newman has been appointed Chief of Ground Safety at Wright-Patterson Air Force Base, Ohio to replace Ernest L. Harlan, who has assumed the position of Chief of Ground Safety, Central Air Materiel Area Europe, at Chateauroux, France.

Mr. Newman, for the past two years, has been Chief Safety Engineer of the Air Materiel Force, European Area, at Wiesbaden, Germany. Prior to his European assignment, he was Director of Ground Safety for Eighteenth Air Force at Donaldson Air Force Base, South Carolina.

During his European assignment, he was the United States Air Force representative to the First World Congress on the Prevention of Occupational Accidents held at Rome, Italy in 1955. He served as Field Coordinator in the organization of the Federal Safety Council in Europe and as Chairman of the Organization Committee of the European-African-Middle Eastern Society of Safety Engineers.

UNITED STATES STEEL CORP. announces the appointment of *George H. Reilly*, general supervisor of safety, Lorain Works, National Tube Division, to the position of assistant manager of industrial relations at National Tube's Fairless Works, as revealed by Robert Urquhart, general superintendent of the Lorain plant.

A native of Lorain, Mr. Reilly has been a leader in Lorain civic and welfare activities, as well as in the organization and promotion of industrial safety at local, state and national levels.

Mr. Reilly began his service with United States Steel Corp. in 1934, when he was employed as a student management trainee at Ellwood Works in Pennsylvania.

Since coming to Lorain, Mr. Reilly's service has been notable for outstanding plant safety achievement, including five Awards of Honor, highest recognition by the National Safety Council; one safety Council Award of Merit; and six awards from the Industrial Commission of Ohio. Last year, Lorain Works compiled an injury-free span of 85 days and more than five million manhours to establish a new U. S. Steel record for integrated steel plants.

Active in state and national safety organizations, Mr. Reilly is vice president for industry of the Ohio State Safety Council and assisted in the development of the present Ohio Safety Codes. He has also served as president of the Lorain Safety Council and chairman of the Lorain County Industrial Safety Council. At present, he is chairman of the Lorain Chapter of the Red Cross, a member of the Society of Ohio Safety Engineers, the American Society of Safety Engineers and other organizations.

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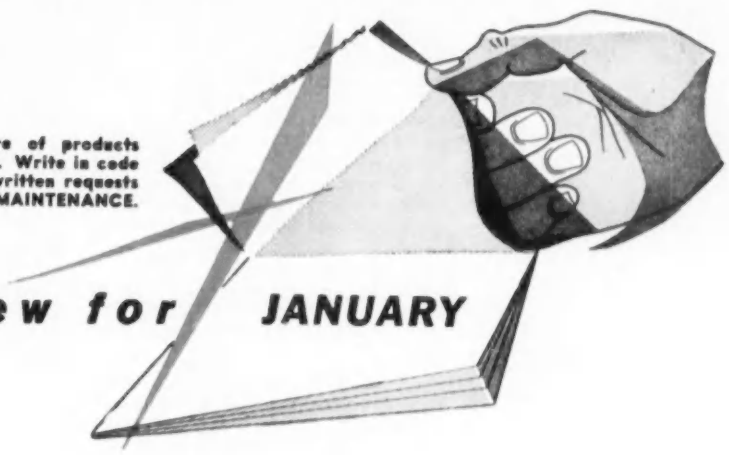

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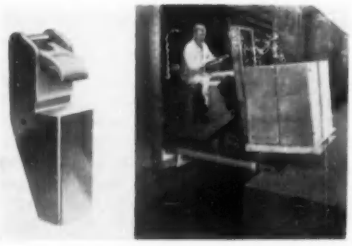


DOCKBOARD SAFETY CLAMPS

(Use Key # 726 on Inquiry Card on page 75)

THE Adjustable Span-Lock, a device which helps lock Magcoa Dockboards in position between dock and rail car or dock and truck, has been introduced by Magnesium Company of America. Simple and easy to use, they can be positioned and repositioned to meet varying dock-to-carrier span requirements without need for tools, according to the manufacturer. An easy pull on a lever arm opens the jaws of the Span-Lock and permits you to position it at the edge of the loading dock. A firm push against the lever arm locks the jaws to the dockboard safety curb. The bottom of the device extends down into the span between dock and carrier, fits flush against the edge of the dock.

Normally, Span-Locks are used in pairs (one on each safety curb) in conjunction with the magnesium floor members which are welded to the bottom of Magcoa Dockboards as a standard construction feature. In a typical loading dock operation, the Dockboard is placed into position with the floor member flush against the edge of the carrier. Then the Span-Locks are locked into position flush against the edge of the dock. This two-way locking action prevents the board from slipping in either direction.

According to the manufacturer, the "Span-Lock" is the only board locking device which can be positioned exactly where required for slip-proof operation under all possible dock-to-carrier span variations; the only locking device which locks in a positive manner, thus minimizing the possibility of bouncing out of position during loading or unloading.

ACETATE SAFETY FRAME

(Use Key # 727 on Inquiry Card on page 75)

DURABILITY and modern styling are combined in a new, all-acetate safety frame developed by the Bausch & Lomb

Optical Co. The frame features a new lens shape which provides an improved field of vision, better coverage at the corner areas of the eye, plus attractive appearance. The lenses are Bal-Safe toughened lenses, heat-treated for high impact resistance.

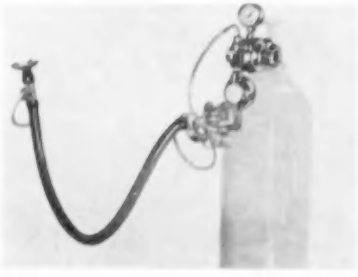
The frame is cut from solid sheet acetate to add strength in the bridge, temple, and endpiece areas. It has rigid or adjustable nose pads and is available with either spatula or cable temples. Safety-cross plaques on the front temple corners strengthen the endpiece assembly while identifying the glasses instantly as safety eyewear with safety lenses.

BREATHER & RESPIRATOR UNITS

(Use Key # 728 on Inquiry Card on page 75)

TWO newly designed units, the Ohio-Dotco Deep Breather and the Ohio-Dotco Respirator, are now being offered by the Ohio Chemical & Surgical Equipment Co., division of Air Reduction Co., Inc. The deep breather is suitable for general hospital use. Mouthpiece pressure is set and sealed by the technician. This prevents altering of treatment by unauthorized personnel. The respirator is for use by experienced personnel in the hospital, clinic or doctor's office. Simple adjustments provide any true mouthpiece pressure, negative or positive, registered on the gauge at all times.

One notable feature of the compact units is breathing assistance by patient demand. This is effortless or automatic, as indicated by the patient's needs. In addition, maximum comfort adjustment is provided for every patient, and breathing is assisted without reducing cardiac output or tiring the patient. Other features include delivery of high aerosol concentrations, no interference with the patient's breathing, a combination I.P.P.B. unit—resuscitator and respirator, and a durable, easily-serviced breathing valve. The deep breather is available in a cylinder model, and the respirator in a pipeline or cylinder model. Optional accessories include an oxygen diluter and a negative pressure attachment for the respirator.



NEW SURGICAL LIGHT

(Use Key # 729 on Inquiry Card on page 75)

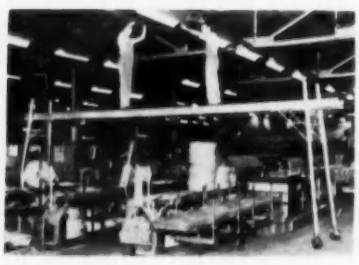
A SURGICAL light designed for operating rooms and first aid departments has been announced by Carpenter Mfg. Company. The light has built-in, automatic safeguards which assure constant, flicker-free light in case of power failure. In addition, the surgical light automatically compensates for any drop in line voltage which, in an ordinary lamp, would cause dimming. Light failures have occurred during operations, severely handicapping doctors and attendants, and in some cases, have resulted in serious consequences to the patient.

The operation of the light requires no special skill. It can be plugged into any 110-10 volt A.C. line. A drop in this line voltage or complete failure of current will automatically connect the emergency, battery-operated circuit. When power is restored, the unit will automatically return to regular power and will recharge the battery. The manufacturer claims that the new unit requires a minimum of maintenance.

PORTABLE BRIDGE SCAFFOLD

(Use Key # 730 on Inquiry Card on page 75)

AN adjustable, mobile, all-aluminum bridge scaffold has been introduced by Aluminum Safety Products Inc. for use by painters, contractors, maintenance crews, etc. Easy adjustments may be made on all four uprights and in the length as well to meet varying conditions such as inclined floors, stair wells, etc. The Aldek bridge scaffold spans areas up to 30 feet in length and 20 feet high without obstructing work and takes working loads up to 1600 lbs.



Snap-in rungs provide easy access to the work platform, which is slip-resistant and can be used independently as a stage, kicker or plank. Safety rails and toeboards are also available. Heavy-duty rubber tire casters simplify rolling the scaffold into position and these casters have positive locks for safety as well. The bridge scaffold is compact and can be stored away flat, thus eliminating storage problems. It cannot rust and requires no maintenance.

ALUMINIZED ASBESTOS CLOTH

(Use Key # 731 on Inquiry Card on page 75)

KAMKLAD, a new fire protective, aluminized asbestos cloth said to reflect over 90 percent of radiant heat has been introduced by the Keasbey & Mattison Co. The company states that safety garments made of Kamklad make it possible for the wearer to withstand temperatures in excess of 2500 degrees Fahrenheit without discomfort or ill-effect.

Field tests in steel mills have disclosed that this new fire protective cloth makes

it possible to change ingot reheating furnace doors while operating at 2100 degrees Fahrenheit. Also, only one melter is necessary on the electric furnace the full ten minutes of the slagging-off period. Previously a man had to be relieved every two minutes. A utility company tested a Kamklad safety garment by having a man walk through a 2500 degree Fahrenheit propane fire in order to extinguish it. The test was successful and he accomplished the job without difficulty.

Kamklad is a tightly woven asbestos cloth surfaced by a special process with a heat protective aluminum foil. The smooth aluminum foil surface reflects radiant heat with which it comes in contact thus shielding the wearer from this major hazard. Flying sparks and cinders fall right off without damaging the material. It resists water, oils, and, to all practical purposes, has the same corrosion-resistant qualities as the aluminum with which it is covered. In addition to its use in protective garments Kamklad has many other applications such as fire baffles in industrial plants, aircraft hangars and garages. It can also be used as fire protective curtains in welding booths, refractories, kilns and in other similar high temperature areas where protection from heat is necessary.

SAFETY SEAT BELT

(Use Key # 732 on Inquiry Card on page 75)

A PASSENGER safety belt for use in automobiles and trucks has been introduced by Assured Safety Devices, Inc. Tested and approved by independent laboratories, the belts are made of nylon and feature a metal-to-metal fastening buckle. Belt strength is in excess of 5,000 lbs., said to be sufficient for accident impacts.

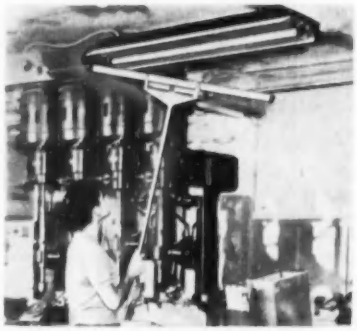
Use of the seat belt means that occupants can be safeguarded during short stops as well as accident impacts. The belt holds the wearer firmly against the seat, thus preventing his being thrown around in, or thrown out of the vehicle. Dangerous head injuries can be eliminated or their intensity lessened. The new device should be of special interest to insurance companies, fleet operators and safety directors (particularly those whose personnel drive to work.)

MAINTENANCE LIFT

(Use Key # 733 on Inquiry Card on page 75)

FOR various operations in production, installation, and maintenance, The Ballymore Company has introduced its Mobile Access Lifts. Designed for maximum reach up to 42' above floor level, the hydraulically-operated lift is said to provide ease of positioning, speed of elevation, and safety. It can be used indoors or out and folds for transporting from one location to another.

High stability is assured by screw-type leveling jacks at each corner to hold the lift in a steady, level position. Large swivel-type casters permit ready mobility. A ladder provides access to the platform in the "down" position. The mechanic has complete control for raising, stopping, and lowering by means of a pushbutton control located on the platform's guardrail. The area of the platform is 2' 3" by 2' 3" with platform load rated at 350 lbs. Platform is equipped with 3' high guardrails and can be rotated through 360°. Six standard models, for maximum reach from 19 to 42 feet, are available. All models have 110 v., 60 c. single phase pump motor plus hand-operated pump for use where electric power is not available or when power shutdowns occur.



FLUORESCENT TUBE CHANGER

(Use Key # 734 on Inquiry Card on page 75)

A NEW, labor-saving fluorescent tube changer has been made available by the Pattern Products Co. The tool is designed to permit tube changing from the floor level. To use, two U-shaped collars on the tool are positioned firmly against and under the tube to be removed. Twisting the handle removes the burned-out tube safely and easily. By reversing the procedure, new tubes can be set in place.

The all-aluminum Model No. 200 can be used as a 4-ft. or 8-ft. unit, and can be used to reach fixtures up to 15-ft. above floor level. According to the manufacturer, it will change fluorescent tubes on any standard fixture, including push-type fixtures. Two-piece design allows the changer to be stored in a minimum of space.

LOCKING SEALANT FOR THREADED FASTENERS

(Use Key # 735 on Inquiry Card on page 75)

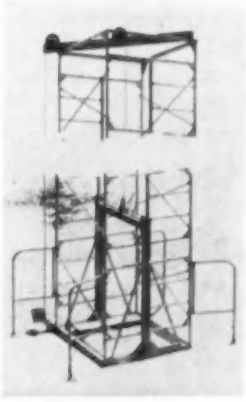
A NEW method of locking ordinary threaded fasteners using a chemical sealant trademarked Loctite (R) has been announced by the American Sealants Company. This new liquid hardens automatically in the joints between metal parts, sealing the joints pressure-tight and bonding the parts together with a tough heat and oil resistant plastic. Machinery assembled with ordinary nuts and bolts which have been wetted by tumbling briefly with Loctite (R) sealant will not loosen under the most severe conditions of vibration because the mating threads become filled with hardened plastic.

Although providing a superior lock to mechanical type lock-fasteners, treated nuts and bolts can be easily removed with ordinary tools. The problem of set screws which loosen can be effectively eliminated by treating them with the new sealant. Loctite (R) sealant seals and bonds sleeve joints between metal parts without the use of corrosive fluxes and without danger of tarnishing polished surfaces with heat. Because it is a penetrating liquid which hardens automatically in pores or joints in metal parts, it is particularly well suited to sealing porous welds and leaky threads in pipe lines and process equipment.

PORTABLE HOISTING TOWER

(Use Key # 736 on Inquiry Card on page 75)

A NEW, light duty material hoisting tower that assembles with standard parts has been announced by Bil-Jax Inc. The



tower is designed to operate under loads up to 2000 lbs. for heights up to 50 feet. Open stock design permits the erection of the tower to any desired height up to maximum by the adding of sections.

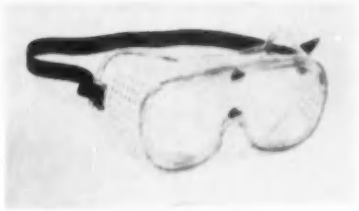
The tower is available with frames and braces in a variety of sizes to interchange with whatever size scaffold end frames already on hand. Frame sizes offered include 4' x 4', 5' x 4', 5' x 4' 6", 5' x 5' and 5' x 6' 6". Component parts include the cathead, the top frame section, platform assembly tower frames and braces. Optional equipment includes such items as power units, steel cables, cable guides, and outrigger frames. The tower is equipped with an automatic safety stop designed to prevent accidental descent of the platform.

FIRE-RESISTANT HYDRAULIC FLUID

(Use Key # 737 on Inquiry Card on page 75)

A NEW fire-resistant hydraulic fluid has been developed by E. F. Houghton & Co. which has been compounded expressly for systems operating at temperatures above 150 degrees F. and for heavily-loaded pumps and bearings. Known as Houghto-Safe 1020, the synthetic fluid offers a greater film strength and lubricity and is fortified with rust preventives and anti-foaming agents. This fortified fluid is a companion to the original water-base material, Houghto-Safe 620, suitable for most applications.

The new Houghto-Safe 1020 is the latest fire-resistant hydraulic fluid developed by Houghton's continuing hydraulic research program and is designed only for those systems where high operating temperatures and heavily-loaded pumps and bearings call for specially compounded synthetic fire-resistant fluids.



PLASTIC GOGGLES

(Use Key # 738 on Inquiry Card on page 75)

A NEW all-purpose plastic goggle has been introduced by Wilkie Optical, Inc. Designated the Softsides Model 550, it has soft, flexible sides for comfort and fit, may be worn over all types of modern dress glasses and safety spectacles, and offers full vision at any angle.

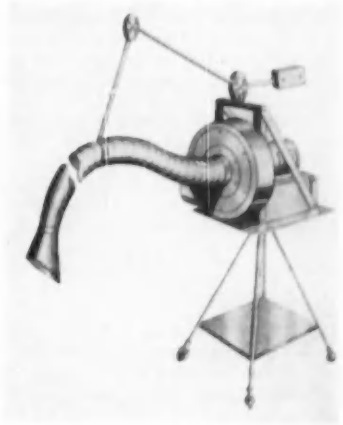
According to the manufacturer, the vent pattern of the goggle provides draft free ventilation, necessary to eliminate fogging. Protection from flying objects is afforded by the use of an .040 thick acetate lens. Lenses are easily replaced by releasing two snap fasteners. The goggle is available with an elastic headband and green or clear lens. It is intended for general industrial use.

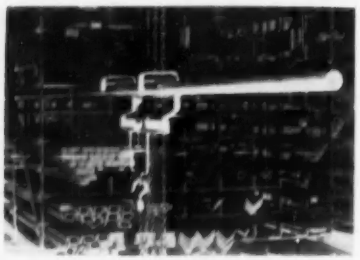
MOBILE FUME EXHAUSTER

(Use Key # 739 on Inquiry Card on page 75)

THE Engwald Corp. has introduced a mobile, stand-type exhauster, the W200-50, for the removal of noxious fumes from fume generating sources "out of reach" of permanently-fixed exhaust systems. Mounted on steel casters, the unit applies a high suction at the fume source, then discharges the fumes into the external atmosphere.

The exhauster is available with a gasoline or electrically driven blower capable of moving up to 800 cu. ft. of air per min. Its 8-ft. stainless steel hose assembly includes arms and counter-balance for universal positioning. Choice of hose diameters includes 4-, 6- and 8-inch models.





BAR STOCK HANDLER

(Use Key # 740 on Inquiry Card on page 75)

THE BAR-LUGGER, a new type bar stock safety handler has been made available by Industrial East Co., and is said to speed up and simplify the moving and handling of bar stock by 60 percent, in and out of pigeon-hole storage bins. One operator can safely handle up to 6 inch round, square or hex-shaped bar stock where formerly two or even three men were required, according to the company. The unit weighs approximately 40 lbs., connects easily in one motion to the plant overhead conveyor.

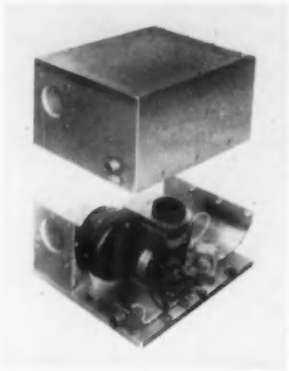
To store a bar of stock, the bar is securely picked up on the Bar-Lugger, clamped on the V grooved rollers by means of a 1 inch-8 screw and directed into the pigeon hole. By pushing slightly on the end of the bar, the rollers permit the bar to roll easily onto the rack. Withdrawal is the same, in reverse. Special advantages with use of the Bar-Lugger is that the operator can automatically hold and balance the stock in mid-air with no added support. The Bar-Lugger is re-enforced at weight bearing points and is made for heavy duty work.

INFRA-RED ANALYZER

(Use Key # 741 on Inquiry Card on page 75)

A NEW electronic infra-red analyzer for most continuous-flow chemical analysis problems has been announced by Mine Safety Appliances Company. The new Lira Model 200 is said to provide quick and accurate analysis of a single component in a simple or complex mixture of gases or liquids. The accuracy of measurement is one percent of full scale with a high speed of response. It operates on the principle of direct deflection rather than electrical-null-balance. It can be used with an integral indicating meter as well as a recorder. The unit can be used to detect any variation in the composition of a flowing liquid, as in a chemical processing plant, in order to "trigger" automatic corrections where necessary. It is useful in the petro-chemical, chemical, petroleum and metallurgical industries, as well as in industrial hygiene for air pollution problems. It is capable of playing an important role in the direct control of process stream composition, the control of heat-treating atmospheres and combustion, and the measurement of toxic materials such as carbon tetrachloride, methyl bromide, sulphur dioxide and phosgene in air.

A five-position sensitivity test switch permits checking without the necessity of exposing the chassis. Also part of the panel is a five-position voltage test switch which provides readings of the B-plus, oscillator and plate voltages of the first amplifier, as well as the infra-red source and cathode voltages of the amplifier's output tube. The indicating meter is easily visible in either the explosion-proof or non explosion-proof models. Response of the Model 200 is 90 percent of final reading in five seconds with an accuracy of plus or minus one percent of full scale. The instrument, claimed to be unaffected by plant vibration, warms up in 30 minutes and requires only 200 watts. A constant voltage transformer compensates for line voltage variations from 95 to 125 volts.



ELECTROSONIC CLEANING UNIT

(Use Key # 742 on Inquiry Card on page 75)

A NEW electrosonic cleaning unit has been made available by the John B. Moore Corp. Designated the Telephonics Tank Mounted Transducer, it is said to offer a larger capacity transducer for efficient conveyor operations and the cleaning of larger objects or a greater number of small objects. The unit is of the magneto-strictive type and, according to the company, results in higher efficiency over the entire cleaning area.

The air-cooled unit is simple and safe to use, even for a novice. (Its air cooling elements are shown in the accompanying picture.) Operation requires only that the cleaning solvent be placed into the container, along with the parts to be cleaned, and the switch thrown. In this manner, it is possible to clean parts and components which must be freed from gross and microscopic quantities of oil, grease, abrasives and other contaminants. The generator can also be adapted to remove mill scale or corrosion in pickling acid or alkaline solutions. It permits the cleaning of intricate shapes and small objects including watches, clocks, and parts, removing foreign matter from crevices, blind cavities and points normally inaccessible.

TWO-SPEED ELECTRIC HOIST

(Use Key # 743 on Inquiry Card on page 75)

THIS FRAME 1, 2-speed Wright Speedway Electric Hoist, equipped with fractional horsepower 1800/450 rpm motors, provides a fast lifting and lowering speed and a slow, ¼ normal speed, for gentle positioning of production work.

Manufactured by the Wright Hoist Division, American Chain & Cable Company, Inc., the unit is said to parallel the sensitivity of control of air hoists and to feature easy maintenance. The housing is designed so that the side and end covers can be quickly unscrewed for the servicing of exposed parts in a matter of minutes. Two easy adjustments of a set screw are all that is required to compensate for brake lining wear.

This Frame 1 line, available in parallel mounting, cross mounting, hook mounting and rigid or bolt mounting, utilizes totally enclosed NEMA specification motors for operation on ac or dc. Heat treated alloy steel gears with hardened wearing surfaces are used throughout. They are of the stub tooth 20 degree angle involute gear profile type. The automatic brake, which is immersed in an oil bath, assures uniform operations in varied atmospheres and safe holding of load while in suspension.

COMBINATION FRAME SAFETY SPECTACLE

(Use Key # 744 on Inquiry Card on page 75)

DESIGNED for appearance and comfort, protection and visibility, the Welsh Mfg. Co. has introduced a new combination metal and plastic frame safety spectacle with broader vision, square-shape lens. It features a metal bridge and metal eye wires with colored plastic upper frame structure.

The spectacles may be obtained with green or clear heat-treated glass or CR-39 plastic lenses. They are available in a choice of eye sizes, bridge sizes, temples and frame color.

PORTABLE ADDRESS SYSTEM

(Use Key # 745 on Inquiry Card on page 75)

A TRANSISTORIZED, portable public address system that requires no external power source and weighs only 16 lbs. has been made available by the Antrex Corp. The unit, called Redcap, is built into an attache case about 6 inches wide, 14 inches deep and 18 inches long. Components are a high fidelity transistor amplifier, a heavy-duty eight-inch speaker, a microphone and controls, and two flash-

light batteries. The unit draws all its power from the two batteries, ready for instant use anywhere without electrical connections. Batteries are easily replaceable and give up to 50 hours of service.

For use either inside or out of doors, the address system is said to deliver sufficient volume to be heard clearly over an area of more than 6,000 sq. ft. without auxiliary speakers. Self contained microphone may be used either in the hand, or stand-mounted. According to the company, the unit is a true high fidelity unit, making it ideal both for speech and music reproduction. The transistor amplifier has a frequency response of from 50 to 15,000 cycles per second, providing distortion-free sound reproduction throughout the range of audibility.

LADDER PLATFORM

(Use Key # 746 on Inquiry Card on page 75)

THE RES-TEP, an all-aluminum platform for standard rung-type ladders, has been announced by the American Allsafe Co., Inc. The platform may be easily moved from one rung to another and will not interfere with ascent or descent of the worker.

According to the manufacturer, the platform weighs less than four lbs. and features a slip-resistant footing surface. The device is said to eliminate leg fatigue generally associated with the use of rung-type ladders. Another safety feature is that the most of the weight on the platform is distributed to the ladder uprights, and not to the rungs.

AUTOMATIC EMERGENCY LIGHT

(Use Key # 747 on Inquiry Card on page 75)

THE GENERAL Scientific Equipment Co. has introduced a new automatic emergency lighting unit designated the Model E. In case of power failure, this unit is said to provide protection and sufficient illumination to carry on operations for many hours. It is designed primarily for industrial plants, laboratories, hospitals, institutions and other places where an extra margin of safety is a must. Without touching a switch, the light instantly illuminates the room when regular power fails.

The unit is powered by a storage battery

built into the portable set. A trickle charger automatically maintains the charge of the battery. A built-in hydrometer indicates the state of the battery at a glance. To put the unit into operation, simply plug in to any A.C. circuit. The lights are sealed beam of 100 C.P. and will provide continuous light for 10 hours.

ANCHORING COMPOUND

(Use Key # 748 on Inquiry Card on page 75)

A NEW pourable cement that it reputed to set anchor bolts in 10 minutes or less is announced by The Monroe Company, Inc. Known as Evr-Tite, the powder mixes readily with water to form a semi-fluid, easily-poured compound. When applied around an anchor bolt, it attaches itself to the bolt surface and fills all sections of the hole. Then, in 10 minutes, it is said to set with a minimum of shrinkage or "pulling away" from either bolt or hole.

According to Monroe, anchor bolts cemented with Evr-Tite can be drawn tight

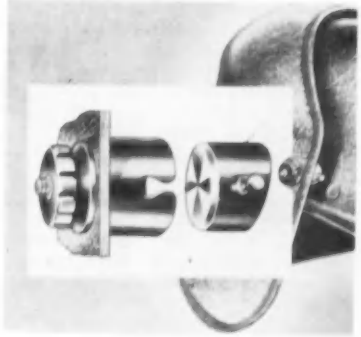
and light equipment put in operation within a half hour. For heavy, vibrating machinery, it achieves high impact strength in less than one hour. The product is recommended for securing anchor bolts in the fastening of pipe flanges, hand rails, partitions, etc. It also is suitable for repairing shallow holes in concrete floors. Packaging includes 12 lb. cans; 60 and 125 lb. pails, and 225 and 300 lb. drums.

WELDING-HELMET SAFETY-CAP LOCK

(Use Key # 749 on Inquiry Card on page 75)

A RUGGED, mechanical-type attachment known as Quick-Loc has been introduced by the Fibre-Metal Products Co., and is intended to make complete safety units of welding helmets and the company's own SuperGard safety caps. Because of its compact design, it limits tension or spreading of the helmet shell. The small friction adjusting knob alone, which may be operated with a gloved hand, is on the outside of the helmet shell. The safety cap part of the attachment is a wide-based plastic molding containing a spring-loaded plunger lock that is depressed in order to dovetail with the helmet section.

The helmet part is protected by the helmet and built integral with the adjusting mechanism. It is placed to bring the glass holder of the helmet close to the eyes, providing the widest possible vision. The new attachment is supplied either as part of the welding helmet-safety cap combination or in kit form for the conversion of present equipment.



ROTARY PAINT GUN

(Use Key # 750 on Inquiry Card on page 75)

BUILT around the principle of a centrifugal pump, the Rogers Rotary Magic Painter literally "throws" paint on any surface. Introduced by Napco, Inc., the unit has a self-contained motor which spins the rotor blades at speeds up to 22,000 rpm, pumping the paint from a twist-on aluminum can. The paint spread can be controlled from a fine line to a foot or more spread by the gate-like opening. Overspray and masking are cut to a minimum and it is claimed that a complete room can be painted in less than 30 minutes.

Adaptable to inside or outdoor maintenance, the unit can be used with any water base or oil plaint. It is also suitable for all types of stencilling and has also been used to apply a fine oil spray to finished machine parts.

GENERAL PURPOSE WORK GLOVES

(Use Key # 751 on Inquiry Card on page 75)

A COMFORTABLE, general purpose welding and work glove designed for long life has been introduced by the Singer Glove Mfg. Co. Made from specially tanned leather, it has the softness and heat-resistance of horsehide, and the long-wearing qualities of steerhide.

The glove palm is lined with soft, resilient terry cloth that provides a cushion intended to reduce the wearer's fatigue and increase glove life. The looped pile of the cloth also gives added insulation. The palm and back of the gloves are made of one piece leather, eliminating extra seams; the thumb is fully welted. The cuff is made of heavy, flame-resistant duck.

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FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

FIRE PROTECTION

Fire Locator System 221
Edwards Co., Inc. 4-page brochure fully explains a fire protection unit to detect a fire automatically, and indicate at a central point the location of the fire. Its main power supply is 120 volt, 60 cycle AC. However, the unit is designed to operate on batteries in the event of a power failure.

Extinguisher Inspection Guide ... 222
Buffalo Fire Appliance Corp. Complete information for conducting a comprehensive inspection of extinguishers is outlined in this handy brochure. Eight types of extinguishers are featured, including soda-acid, automatic clear water, foam, vaporizing liquid, etc.

Photoelectric Controls 223
Photoswitch Div., Electronics Corp. of America. Descriptive data, specifications and operational charts for a line of photoelectric systems are contained in this 24-page, illustrated brochure. The systems are intended for industrial control applications, including smoke detection and high temperature measurement and control.

FLOORING & MAINTENANCE

Maintenance Equipment & Supplies 224
Finnell System, Inc. Illustrated, 4-page folder describes a line of floor maintenance machines and equipment, as well as a variety of waxes, sealers and cleaners. Includes recommendations for use and an outline of specifications for the products.

Snow Melting Compound 225
Speco, Inc. Featured in this illustrated bulletin is an ice and snow melting compound said to be almost 100 percent chemically active. Chloride-free, it will not corrode aluminum or other metals or harm cement, concrete and asphalt.

Sweeping of Congested Areas ... 226
G. H. Tennant Co. 8-page illustrated booklet reviews the advantages of mechanized sweeping of congested areas formerly swept by hand. Included is a check list to pre-determine a power sweeper's usefulness, sanitary value, safety, etc.

Floor Absorbent 227
Tru-Sorb Corp. A liquid absorbent for safe, dry floors is featured in this illustrated brochure. An all-purpose absorbent, it may be used to blot up any and all liquids including oils, paints, acids, inks, etc.

Floor Maintenance 228
Hillyard Chemical Co. A quarterly booklet that deals with everyday floor maintenance problems. This issue features an article on the care of asphalt tile floors, and includes a chart outlining their particular maintenance problems, causes and remedies.

MAIL POSTAGE PAID CARD FOR MORE DATA

Wood Finishes & Sealants 229
Brulin & Co., Inc. Concise bulletin explains a line of floor finishes and sealants for use on wood floors. Included in the group is a rapid-drying, combination seal and finish for floors where only a minimum drying time is available.

TOOLS

Tool Hand Guard 230
Temco, Inc. Illustrated bulletin details a hand guard for use with any type of hand striking tool. Available in several sizes, the guards will fit any tool used in conjunction with a hammer.

Safety Chuck Keys 231
Lindstrom Mfg. Co., Inc. A line of safety chuck keys and lathe wrenches are shown in this illustrated bulletin. Because the tools are self-ejecting, they are said to eliminate injuries caused by "flying keys" left in the chuck.

Rescue Equipment 232
Blackhawk Mfg. Co. 12-page manual features a complete line of hydraulically-operated rescue equipment for releasing victims trapped under debris, in burning buildings, wrecked vehicles, etc. Illustrations provided show how victims may be freed from a wide variety of disaster situations.

PERSONAL PROTECTION

Lineman's Waterproof Clothing .. 233
John E. Dorsey Co. 4-page brochure features a brand of lineman's waterproof suits. The suits, which include jackets, overalls and hoods, are made of a nylon-neoprene material, are light-in-weight, and oil-, acid- and mildew-proof.

Gloves & Finger Cots 234
Industrial Div., Wilson Rubber Co. A complete line of finger cots and curved-finger rubber, latex, neoprene and plastic gloves are fully described and illustrated in this 16-page catalog. Also provided is a two-page recommended-use table showing the resistance ratings of the glove materials to chemicals and solvents commonly used in industry.

Eye & Face Protection 235
Glendale Optical Co., Inc. Highly informative catalog details a full line of eye and face protective equipment including face

(Continued on the next page)

SPECIAL OFFER BELOW VALID ONLY FOR THREE MONTHS AFTER PUBLICATION DATE

READER'S INQUIRY CARD

HOW TO GET FREE DATA! **(No Postage Required)**

ADVERTISED PRODUCTS: Just insert the key number shown under each advertisement in the boxes below.
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FREE BULLETINS & CATALOGS: Insert the key numbers shown on this page.
KEEPING UP WITH RECENT DEVELOPMENTS: Insert the key numbers shown on items in special feature article.

PLEASE PRINT YOUR NAME & ADDRESS

Name _____ Title _____

Company Name _____

Street Address _____

City _____ Zone _____ State _____

☐ Check this box for further details on the product advertised on pages 40-41.

January, 1957

Please send me the following free data

Free Bulletins (Cont'd)

shields, goggles, welder's helmets, eyeshields, etc. An eye safety guide outlining various working hazards and recommended protective equipment for each is also provided.

LADDERS & SCAFFOLDS

Tubular Steel Scaffolding 236
Beaver-Advance Corp. Informative, 12-page booklet explains and illustrates the various applications of a brand of tubular steel scaffolding as employed for building construction, maintenance and repair work. Also featured are materials hoisting towers, structural concrete shoring and other construction and maintenance equipment.

Bridge Scaffold 237
Aluminum Safety Products, Inc. An aluminum bridge scaffold is shown in a number of applications in this 4-page, illustrated brochure. Information includes specifications and construction details for the scaffold which is mobile and adjustable for various working conditions and heights.

MAINTENANCE

Autotransformers 238
General Radio Co. 21-page catalog features a series of continuously-adjustable autotransformers for alternating current use. Specifications and recommendations are given for each of the several models of the voltage control device.

Mercury Vapor Lighting 239
Sylvania Electric Products Inc. 8-page folder describes a line of mercury vapor lamps for outdoor lighting. Economical, efficient and versatile, the lamps may be used in such locations as parking lots, industrial areas, transportation terminals, etc.

Shut-off Valves 240
Coppus Engineering Corp. Informative brochure explains a series of shut-off valves for use on liquid and gas lines. Details of design, function and specifications are given, as well as schematic drawings of the valves.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Clothing
109	Safety Belts
109A	Vehicle Safety Belts
110	Safety Gloves
111	Foot Protection
112	Anti-Slip Soles
113	Oil-Proof Soles
114	Welding Helmets
115	Welding Curtains
	FIRST AID AND PERSONAL HYGIENE
120	Protective Skin Cream
121	Skin Cleansers
122	Sanitary Drinking Facilities
123	Athlete's Foot Control
124	Salt Tablets
125	Noise Analysis & Control
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
130	Throat Medication
131	Eye Wash Fountains
132	Hearing Tester
133	Disinfectant—Deodorants
	FIRE PROTECTION
141	Safety Cans
143	Safer Solvents
144	Degreasing Machines
146	Fire Blankets
148	Watchmen's Control Systems
149	Fire Resistant Hydraulic Fluids
	LIGHTING EQUIPMENT
150	Alarms & Warning Lights
152	Electrical Insulation Tester
153	Fluorescent Lamp Guards
154	Emergency Lights
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180	Safety Tools
	EDUCATIONAL AIDS
181	Safety Signs
182	Safety Awards & Emblems
183	Employee Safety Guide
184	Aisle Marking Equipment
185	Bulletin Boards

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WHAT'S YOUR PROBLEM?

Stonehouse

INDUSTRIAL TRAFFIC SIGNS

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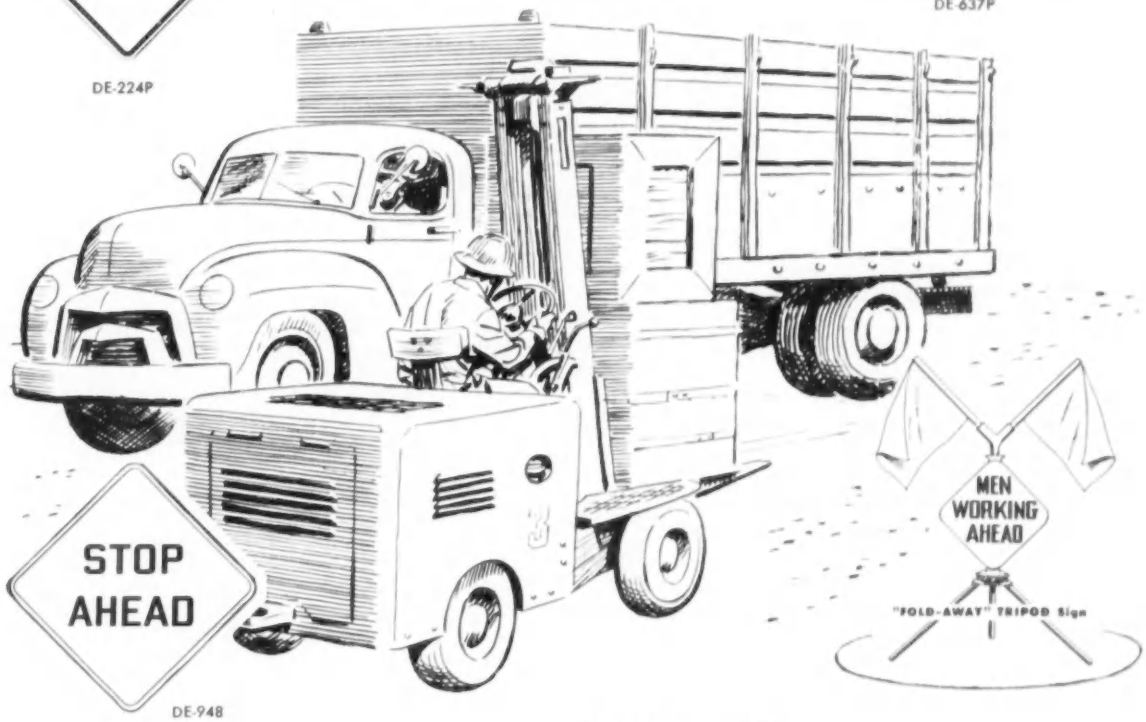
DE-224P

DE-637P



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INDUSTRIAL TRAFFIC . . . with its numberless trucks and other automotive vehicles, CAN be controlled and made safer for everyone.

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STONEHOUSE TRAFFIC SIGNS
For Accident Prevention

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ACCIDENT PREVENTION • *steel* SIGNS IN STANDARD COLORS AND DESIGNS

(Use Key # Z-36 on Inquiry Card on page 75)

Thantis® LOZENGES

first aid for throat irritations

SORE THROATS due to coughs and colds, if neglected, may result in lost man hours of work.

THANTIS® Lozenges contain no antibiotic; they produce no unpleasant by-reactions in the mouth.

THANTIS Lozenges relieve pain promptly—reduce infection—act prophylactically.

Twenty-six years' extensive clinical and lay use has proved the safety and effectiveness of this popular product.

Mercurochrome®

First aid for wounds . . .

Neglect may cause infection which can be prevented by prompt use of 'Mercurochrome.'®

No antiseptic has been proved to be more effective than 'Mercurochrome' for topical application.

(Use Key # Z-37 on Inquiry Card on page 751)

HYNSON, WESTCOTT & DUNNING, INC., BALTIMORE 1, MARYLAND